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Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price: North America, South America and U. S. Possessions, $8; Foreign, $15 a year. Single Copy, 35 cents.

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Cable Address, "Ironage" N. Y.

This Week in The IRON AGE

Vol. 155, No. 26 June 28, 1945

Editorial

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Technical Articles

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Features

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News and Markets

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Did You Ever Visit A Steel-Service Plant?

Let's take a quick look inside one of the 11 Ryerson Steel-Service plants. Before us stretch acre upon acre of steel in countless shapes and sizes—giant structurals, gleaming sheets of Allegheny Stainless, towering racks of alloy bars.

Everything is movement. A friction saw roars as it bites through a beam. We hear the dull crunch of heavy shears. Overhead a giant crane is speeding tons of plates to the loading door. Hundreds of tons are continuously moving out of stock to supply war industry and to speed partial conversion to peacetime production.

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The
IRON AGE

ESTABLISHED 1855

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June 28, 1945

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Free Enterprise

WHAT America needs more than a good five cent cigar—try and get one today for three times that—is a pinning down to earth of loose terms.

The beatitudes properly extolled the meek, the poor and the peacemakers but they omitted any reference to the phrasemakers, probably because they could not by any stretch of the imagination be called blessed.

The dictionary does not tell us what free enterprise is, because it deals only with single words and not with qualified expressions. And what the phrasemakers have done to this perfectly simple and innocent phrasing of an often repeated expression is something to wonder about.

If we could divorce propaganda from the interpretation of meanings and weigh words objectively instead of coloring them with the paint of prejudice, things would be simpler and the process of reasoning expedited. But when people use the same words and mean two entirely different things, conclusions are confounded by confusion.

"Free Enterprise." What does it mean? Scarcely two people will give you the same answer. Yet the hopes and fears of millions are bound up in an endeavor and desire to attain it or to prevent it in the postwar years. Certainly, under the circumstances it should be more clearly defined.

Perhaps the best way to approach the crystallization of this nebulous idea is to delimit it by agreement as to what it is *not*.

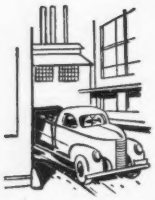
There are two kinds of enterprise—good and bad. Enterprise is not lacking in the fields of burglary, murder, arson and various forms of skullduggery. To give such enterprise freedom would be the antithesis of freedom. So would it be to leave unregulated such enterprise as results in cartels, monopolies in restraint of trade and other forms of unfair competition.

To condemn the endeavor to secure the maximum freedom for good enterprise, because certain bad ones exist, is as wrong and damaging as it would be to advocate complete freedom for bad enterprise. There is a middle ground to this as well as most other problems that we encounter.

In a fairly long and active career I have come in contact with many business and industrial enterprises and most of them have been good ones. Good for labor, for the customers and for the country. We need to give these good enterprises maximum encouragement as a national policy as well as encouraging their birthrate.

Bad enterprises can be controlled by regulation of which there is and has been plenty on the law books. Regulation does not conflict with freedom but aids it, whereas regimentation kills it.

So in talking about the encouragement of free enterprise as a postwar objective let's hereafter distinguish between the sheep and the goats and not crowd both in the same pen.



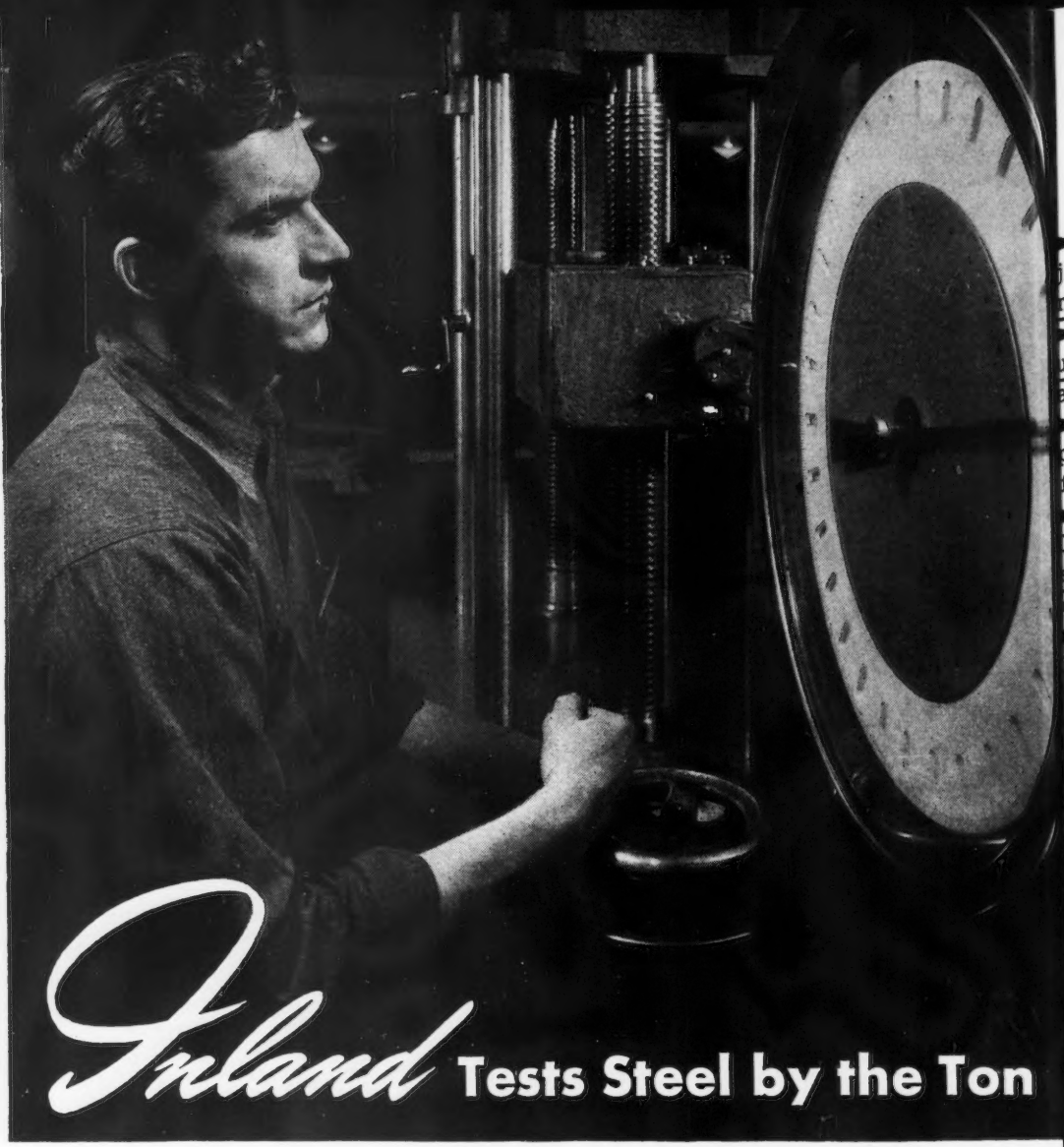
Special duty trucks gather steel samples for the laboratory.

A truck is unloaded at the laboratory, and immediately starts another round trip.

Plate samples are punched to rough form, then milled. Others are sawed, turned, drilled, etc., as required.

Many samples undergo rigid chemical tests.

Metallurgical tests are extremely important for quality control.



Inland Tests Steel by the Ton

Operator determining physical properties on one of the many tensile testing machines in the Inland laboratory.

Darting from mill building to mill building—many times a day, and at night—are Inland trucks on special duty, a duty of vital interest to every user of Inland steel.

They are the sample trucks which rush samples of Inland products to the main laboratory where all required tests must be completed, reported and checked against specifications before steel is shipped.

Samples are gathered for the laboratory at semi-finishing mills—pieces from billets, slabs, etc., that will be tested before the steel is rolled into final form. Also collected are samples of finished products. Depending upon requirements, every piece of steel delivered to the Inland laboratory undergoes rigid physical, chemical, and metallurgical tests. Many of these tests are special developments by Inland—tests that are fast and extremely accurate.

Yes, Inland daily tests tons and tons of steel to assure every customer that his order will measure up to every requirement.

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The IRON AGE
June 26, 1945

NEWS FRONT

► Tin plate consumption is expected to rise to some 80,000,000 base boxes yearly just as soon as war restrictions are lifted. New electrolytic capacity and new regional mills will be added to accommodate this greater demand.

► Rather than being overbuilt in equipment, major producers now consider themselves underbuilt in the tin plate and sheet categories. Four new mills have been ordered and more are in prospect.

► One of the country's newer 1300-ton blast furnaces is being test run under pressure, and is casting pig iron at a daily rate of 1800 tons. Metal quality and furnace operation seem to be improved at the high rate of speed.

► Disinclination of workers to take new jobs when laid off from war plants is leading to the belief that large percentages plan extensive vacations throughout the summer. Many workers have been at it steadily for four years or more and with clear conscience intend to take advantage of release from a war job.

► Senator Kilgore last week scare-headed that the U. S. Steel Corp., Carnegie-Illinois, American Steel & Wire Co., and National Tube Co. had been under obligation to work with the German Krupp concern, because patents for stainless steel belonged to the Chemical Foundation, New York, and the Krupp Co. jointly. The U. S. Steel Corp. was a minor producer of stainless during the life of the Foundation patents and the latter two subsidiaries never produced stainless; furthermore, the news that the quasi-Governmental Foundation and Krupp were joint operators is probably a surprise to both.

► A special type of cork composition has been advantageously used in hydropress forming of aircraft parts. Its great compressibility and its transmission of pressure to the work in straight lines, eliminates the need for confining the material as in the case of the all rubber pad.

► New heavy shell cutbacks announced show a new policy of moving production centers to the west coast to eliminate shipping requirements. New cuts lay down production schedules to April 1946.

Heavy shell producers whose operations are reduced are being ordered, in most cases, to hold their production lines as standby against future increased demands.

► Scheduled tentatively for this week is a meeting in Chicago to convey news of ammunition box and container cutbacks to industry representatives.

► Preliminary plans are drawn up for Dravo Shipbuilding to fabricate a test model tank container to be made of steel plate. It is designed to hermetically seal a tank for storage over periods of years.

This program, if undertaken on a production basis along with the similar program to store shells may be of significance to the plate mills late this summer. Present indications are that this business will carry no priority ratings.

► No more than two or three DPC aluminum reduction plants will be in operation after the war, possibly only one. Aluminum sheet mills at Spokane and Chicago are also considered to be "white elephants", with no possible usage now in sight.

Government experts hope to get some new outside firm into the aluminum business after the war to heighten competition in that field.

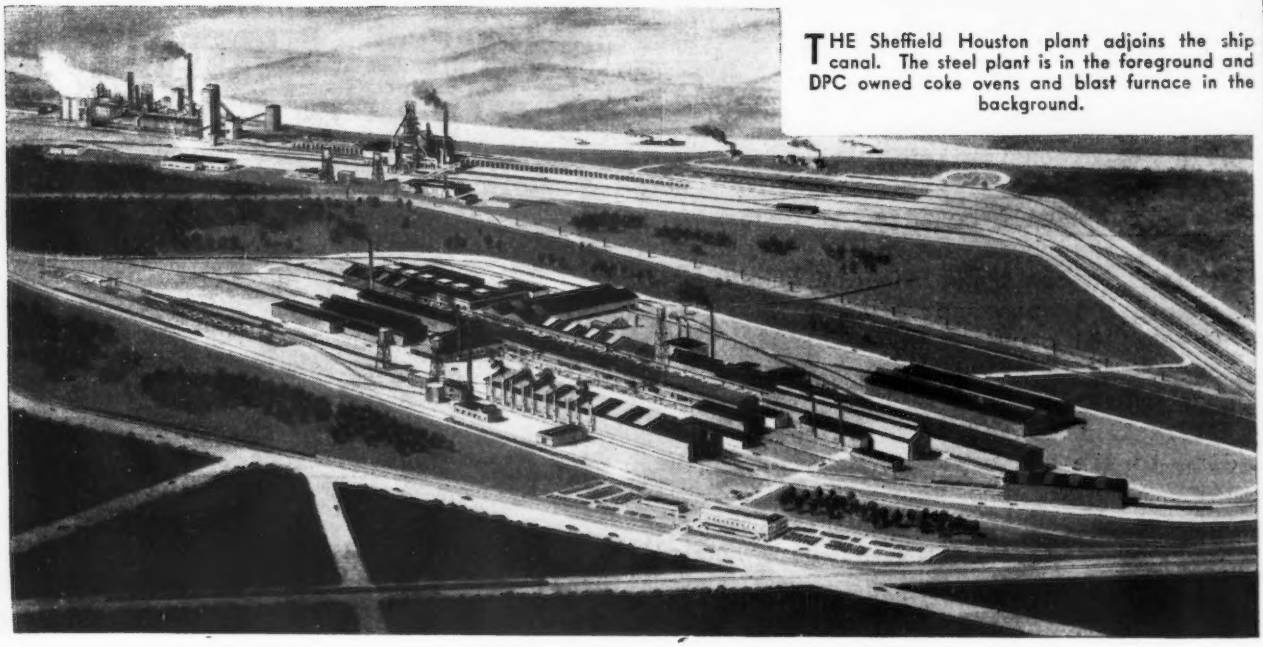
► Prime objective of newly formed machine tool export group in this country is to make American tools a factor in the Latin American market.

► Contract termination policies recently issued cover a definition of scrap, and provide other regulations for the disposal of contract inventories.

Increasing Congressional pressure will probably demand a report from the Surplus Property Board on proposed policies for the disposal of steel plants costing over $5,000,000.

► Auto builders are protesting allocations of car units for production this year. WPB orders permit Crosley, who built 2,000 cars a year pre-war, to build 8,000 units in remainder of this year..

► Light metal enthusiasts from Pacific states are being advised to take a specific plan to Congress for postwar operation of far west plants.



THE Sheffield Houston plant adjoins the ship canal. The steel plant is in the foreground and DPC owned coke ovens and blast furnace in the background.

TEXAS STEEL

By CHARLES T. POST

. . . Growing southwestern market gains stability from Sheffield's integrated Houston works as model ore plant alone operates at DPC's frustrated Lone Star project.

LISTENING to a Texan extol the virtues of his state, an outsider might get the idea that it still is a separate nation. In the past, ironically, steel companies selling there have regarded it almost as export territory.

Mills as far distant as Chicago have been known to ship several thousand tons of hot rolled sheets into Texas well below the market price, even though the same mills are sticklers for price maintenance in their home territories. Atlantic seaboard mills whose pricing policies are correlated closely with tonnage needed to maintain a profitable operating rate find Texas particularly choice territory. The myriad smaller producers located with access to barge travel down the Ohio-Mississippi River system are in a position to make commando raids and retire without wounds.

Until 1940, such a chaotic competitive situation, coupled with the relatively small market which could be assured for any one product, discouraged establishment of steelmaking facilities of substantial character in Texas, although the Texas Steel Co., Ft. Worth, normally turns out some billets and rerolled concrete reinforcing bars.

Despite its vast expanse, Texas holds together well as a separate market territory, particularly when considering merchant products. The Panhandle district centering in Amarillo is susceptible to distribution from points in Colorado, which it almost touches, and oil country sales from Texas distributing points slop over into Oklahoma, Arkansas and Louisiana. This unity notwithstanding, nowhere is it more fatal to lump sales of all finished steel products as a generic unit and assume that because in normal times between 1,000,000 and 1,500,000 tons are distributed annually from Texas points, Texas is ripe for a big steelmaking operation.

First, the merchant products tonnage must be segregated from the total. This lops off about 50 per cent which flows down from the mill warehouse through distributors to retailer, usually farm supply stores, and into the hands of ranchers, who buy it by the pound rather than by the ton. Despite price and distribution vicissitudes which would make steel distributors in other territories shudder, this is the basic, stable Texas market.

The Texas industrial market is dominated by oil industry requirements, largely in the form of tubular products for casing and pipelines but in surprisingly large quantities also as hot rolled products for storage and refinery vessels, as alloys necessary in the refining process, and miscellaneous structural items. Texas is held together by its highways, which require a substantial tonnage of reinforcing and structural steel for construction and maintenance. Until recently, building construction has been a very minor factor.

No statistical studies are available, but in 1939 Texas finished steel sales were divided something like this:

Tubular products	650,000 tons
Plates	125,000 tons
Sheets	120,000 tons
Structurals	100,000 tons
Merchant bars	60,000 tons
Tinplate	100,000 tons
Cast iron pipe	100,000 tons
Wire products	75,000 tons
Cotton bale ties	20,000 tons
Reinforcing bars	50,000 tons
Rails and fastenings	65,000 tons

A study by the National Resources Planning Board based on Temporary National Economic Committee figures covering shipments in 1937 breaks down total Texas shipments of 1,267,600 tons as follows: Pipes and tubes, 663,000 tons; wire rods, merchant bars, concrete bars, 100,200 tons; heavy structural shapes 96,700 tons; plates, 75,100 tons; galvanized sheets 73,200 tons; hot rolled annealed sheets, 73,100 tons; plain drawn wire, 9,200 tons; and all other products, 177,100 tons.

A 1941 study, for which rail shipments were based on studies of ICC records, showed rail shipments of 1,617,969 tons, and projected, in addition, water shipments of 1,094,000 tons. It is not clear whether or not some of the rail shipments may be steel carried from tidewater to the hinterland and thus constitute partial duplication.

Postwar Markets Speculative

Postwar markets are a subject of speculation. Most estimates concede that, with ups and downs, the merchant products consumption will be only slightly greater in the long term. On the industrial side, oil industry consumption will be greatly dependent upon the number of wells drilled. In 1937, 14,237 wells were drilled in Texas; in 1938, 11,810; in 1939, 9325. Against this, only 4800 wells were drilled in 1942, with some increase in 1943 and 1944, the decline due largely to unavailability of materials and manpower. With good market conditions after the war, an unusually heavy oil program is counted on by tubular sales outlets to make up for lost time. The Mid-Continent Oil & Gas Association estimates that about 100 tons of steel, including casing, sucker rods, pumping units and machinery, were used in the average well in Texas in 1939. Making allowance for dry holes, from which a large part of the steel tonnage would be salvaged and reflected in re-use, a projected estimate based on 1939 tonnage could be considered conservative. The pipeline and storage picture will differ somewhat, however. Wartime emphasis on pipeline construction, arising from the difficulties in tanker transportation, will leave its mark, meaning that an increased tonnage will be required for feeder pipeline construction and for maintenance. Conversely, tank farms, providing for storage prior to shipment, will decline, some analysts believe. To reroof and rebottom an average storage tank requires about one-half carload of 3/16 in. plate. In some districts this must be done as often as once a year because of the high corrosive action of sour oils. Postwar, plates will be obtainable from plate rolling facilities installed at Sheffield's Houston mill immediately prior to the war, whereas tubular products still must be "imported." The refinery market is certain to be larger than prewar, everyone agrees, if only for maintenance needs of equipment installed during the war. This is a fruitful field for alloy steels, particularly. The oil boom, which swept Texas out of the path of the depression during the 1930s, shows no signs of declining as an important factor in determining her future as a market for heavy steel.

Barring the possibility that Lone Star Steel may come into the tubular picture, the bulk of tubular tonnage will continue to reach Texas by water shipment, principally through Houston. (As with other products, very little tubular tonnage has been delivered to Texas by water during the war). The present practice of between 85 and 90 per cent of this tonnage being sold through jobbers likewise is expected to continue.

The Texas price structure radiates from Houston although its lines of force have been reduced somewhat in the case of certain merchant products because of zone pricing. Plates, structurals, reinforcing bars and merchant bars all take the arbitrary Gulf Ports base. Nearly all other products are priced upon the Birmingham base, plus 44c. per cwt. rail freight to Houston. Pricing upon the basis of this 44c. rail freight has been the key to the competitive situation arising in the past because of the easy accessibility of Houston to most of the steel producing centers of the United States by barge or vessel. For instance, sheets transported by barge from the Wheeling district have been known to have been landed in Houston in prewar days for as little as Birmingham base plus 22c. per cwt. and from the Atlantic seaboard at Birmingham base plus 30c. Barge shipments from Chicago have been made for 46c., well within the possibilities of freight absorption.

Until just before the war jobbers operating in the great Texas hinterland, where approximately 75 per cent of the merchant products volume is scattered in small bits, were billed upon the basis of Houston plus rail freight. In practice, this rail freight

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SHEFFIELD'S DPC-owned 700 ton blast furnace at Houston is the first modern pig iron unit to operate in Texas.

became just as much a myth as that charged from Birmingham. The Texas retailer regards the truck as a basic means of hauling and, unhampered by the high fixed charges and overhead facing the railroads during the depression, it became common practice for truckers to haul a load of farm or factory produce several hundred miles to Houston, picking up a few kegs of nails, or a few hundred pounds of roofing, siding or fence for the return journey at nominal cost. This fattened the Houston jobbers, but was tough on those in other sections. In 1941, the Tennessee Coal, Iron & Railroad Co. took the lead in establishing a zone pricing system which took into account average truck, rather than rail, rates. Other mills selling wire products and sheets soon followed suit. These were Bethlehem, C. F. & I., Sheffield, Wheeling, Republic, Northwestern Steel & Wire, Pittsburgh Steel, J & L and Keystone. No such convenient solution ever has been worked out for steel fabricators, and nearly all of them have a Houston plant because of freight exigencies.

As with other sections of the country far from prewar steel production centers, and well situated for shipbuilding, aircraft, high octane gasoline, and other types of war production, the product mix of steel sold in Texas has changed greatly during the war with increased emphasis on industrial sales. Delivery of steel to Texas by water has ceased almost entirely.

War Plants' Future

Warborn facilities will cast a heavy shadow on the postwar competitive situation. The Sheffield plant at Houston, of which the basic units were completed in 1941 and the DPC sections in the following year, certainly will exert a stabilizing influence on the wire products, bar mill products, structural and plate markets postwar, whether or not Lone Star Steel ever realizes its ambition to enter the tubular picture. Oil country forgings seem assured of a profitable play with such firms as Hughes Tool (which rumor once had Bethlehem trying to buy) and Reed Rollerbit in the vanguard because of patent control, and important facilities of General Metals and others a factor. Some are optimistic over the future of steel barges, although such construction hardly could utilize the full shipbuilding capacity which has grown up. All sorts of tales revolve around possible use of the aircraft plants at Fort Worth and Dallas. One particularly persistent rumor has General Motors using the plant of its affiliate, North American Aviation, to carry out its announced intention to make heavier inroads on the home appliance field. Both companies deny this possibility, of course, and the steel pricing situation at that location would seem to offer large barriers.

Near the Sheffield plant and Bethlehem and U. S. Steel Corp. warehouses, A. O. Smith operates a plant in the Houston district, producing a Navy product which differs little from pressure vessels widely used in the refinery industry. Texas provides a considerable market for large size welded pipe, a Smith specialty. Kelly Mfg. Co. and Birkhead are important factors in the tub and bucket business, with apparently good prospects. Drum fabrication, at present concentrated at New Orleans, would seem to offer possibilities. The trucking industry has several needs which could readily be supplied locally. Basically, Texas appears to be an expanding industrial market.

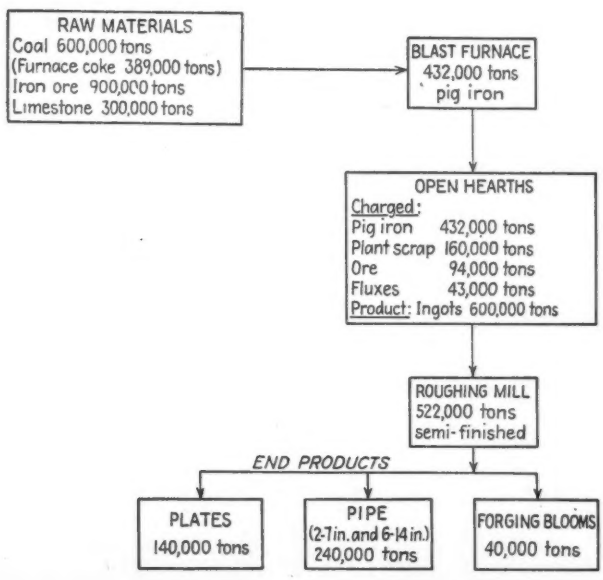
With greater price stability, merchandising programs should play a more important role. Tennessee Coal, Iron & Railroad Co. already has received nation-wide comment for its radio program and farm products marketing service operating on a vast scale.

TABLE I

Scrap Iron and Steel Exports

Customs District	Tons	Value
1940		
Sabine	92,186	$1,580,523
Galveston	359,902	6,330,077
West Coast	387,242	6,207,346
1939		
Sabine	94,051	1,522,737
Galveston	372,756	5,817,404
West Coast	536,577	8,366,415
1938		
Sabine	52,068	769,403
Galveston	336,902	5,037,451
West Coast	357,151	5,741,007
1937		
Sabine	132,044	2,642,020
Galveston	548,721	9,971,573
West Coast	332,993	7,140,840

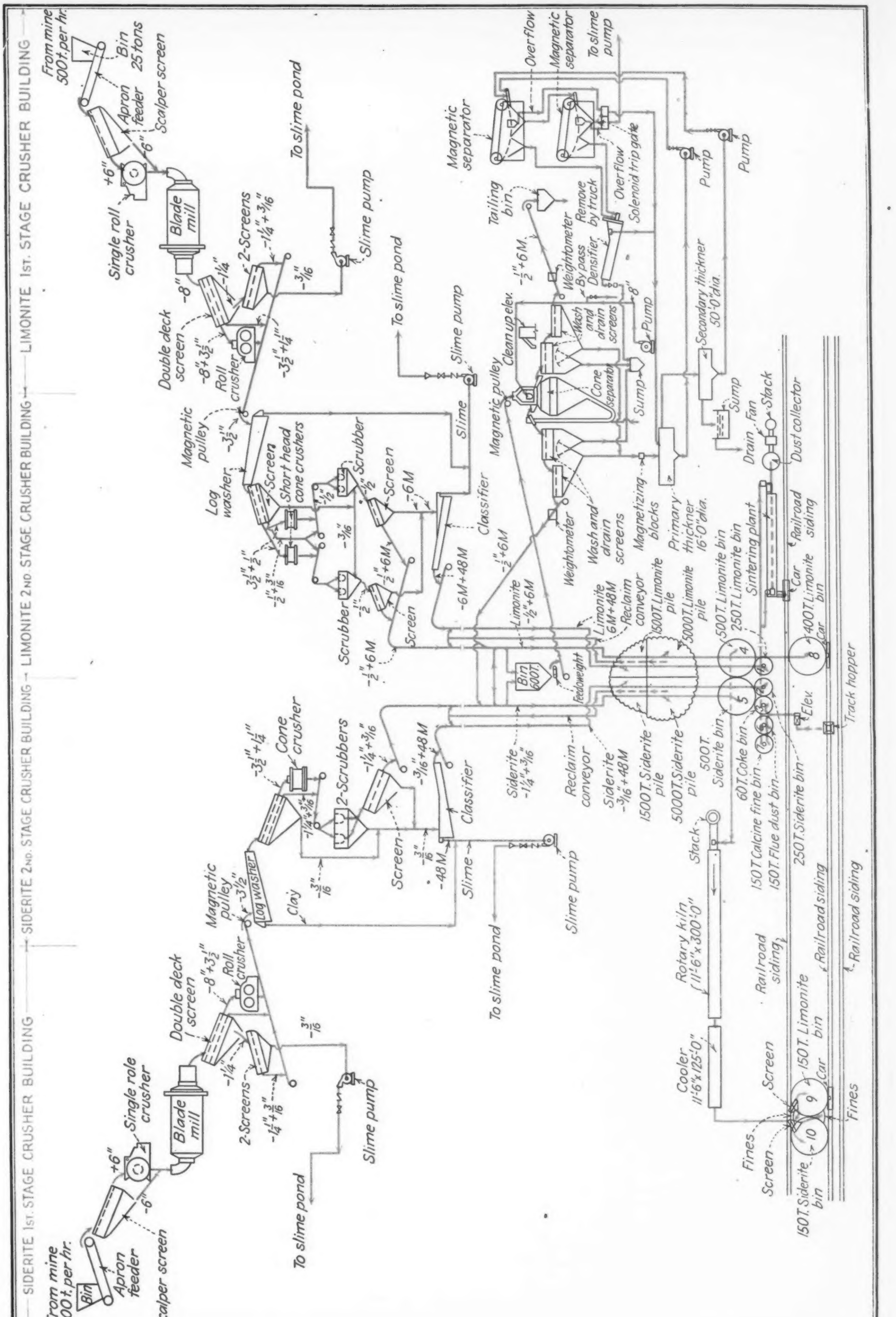
Source: Foreign Commerce & Navigation of the U. S., U. S. Department of Commerce.



PROPOSED product flow sheet, Lone Star Steel Co., showing annual material requirements and end products.

Cheap Scrap Abundant

Always a temptation to produce steel in Texas, and one which helped persuade Sheffield to construct a plant despite the rugged competitive situation, is an abundance of cheap, good quality scrap. Total scrap shipments in a good year in Texas probably total around 600,000 tons. During the years of the export to Japan and Europe, 1937-1940, Texas customs records show shipments totaling as much or more than the entire Pacific Coast (see Table I). In a normal year, such as 1939, $12 per gross ton is regarded as an average price for No. 1 heavy melting steel, f.o.b. Houston. From this mean price, the pendulum may swing either way in line with demand, but generally speaking, scrap prices normally provide a basis for steelmaking at Houston far cheaper than pig iron, except for an extremely large operation. At least, it may be reasonably expected that scrap will provide an extremely high ratio of the total melt. During the war, Texas scrap of prime grades has moved as far as the Chicago district, and specialty grades into the East.



CONDENSED flow sheet of Lone Star's iron ore concentrating plant. Siderite and limonite sections are almost identical through crushing and washing. Provision is made for future doubling of calcining capacity.

Labor appears to be the only restraining factor on supply.

Even if the war has not proven the economic soundness of pig iron production in Texas for local use or export to other districts, it has proven the technological feasibility. This knowledge may be valuable as Texas markets expand. On the other hand, it may become a tool of the school of thought which holds that a steel industry does not exist unless it is accompanied by pig iron production or that industry should be based on the number of jobs it can give rather than production at the lowest price to the consumer.

Sheffield's Houston Plant

The first spadeful of earth for Sheffield's Houston plant was turned May 27, 1941, by the late George M. Verity, founder and chairman of the board of American Rolling Mill Co., the parent firm, accompanied by W. L. Batt, then deputy administrator of the Office of Production Management. As originally laid out, the plant comprised three 110-ton open hearth furnaces, a 26-in. billet and structural mill, a 14-in. rod and merchant mill, an 84-in. hot rolled sheet mill, and a 112-in. plate mill, a wire mill and wire products plant. The plant, described as a $17 million venture, was partially financed by a $12 million RFC loan, paid off when the corporate structure was established in June 1943, as the Sheffield Steel of Texas division of the American Rolling Mill Co. This section of the plant commenced operations in April 1942.

With this country's entry into the war, concern was felt by the government over possible severe pig iron or scrap shortage, or both should the fight go badly. (Ironically the Sheffield interests had been among the loudest in the steel industry to protest large scale scrap export to Japan in the preceding decade.) Thus Defense Plant Corp. suggested facilities be added to the Sheffield plant to provide a fully integrated operation through the pig iron stage and, partially to supply local shipbuilding needs, two more 110-ton open hearth furnaces, a blooming mill and 110-in. plate mill of 216,000 tons annual capacity. Initially, the company rented this section of the plant from DPC. For a six-month period started in February 1945, it will operate mining and pig iron facilities as agents.

Capacities of both sections of the plant, average product mix, and ultimate capacities for rolling of any one product, provided sufficient steel is assigned, are shown in Table II. It is clear that by construction of additional ingot capacity to balance finishing facilities, the plant's output easily could be expanded. The wire products plant has been prevented by the war from ever achieving full production.

In normal times, pig iron production facilities at Sheffield need not necessarily be an integral part of the plant's operating picture unless capacity is greatly enlarged. Pig iron production cost is not high compared to steel industry standards, probably not much over $17. However, with scrap normally abundant at an overall average cost of $11 to $12 per ton, pig iron production is an unnecessary luxury. Even if by some fluke Texas scrap supplies should not be sufficient, it will be feasible, as it was before the war, to ship scrap by vessel from as far as New Orleans, if necessary.

The DPC blast furnace and coke oven plant stands on a separate section of the property from the steel works and rolling mill. The blast furnace, which is rated at 700 tons daily capacity—although it rarely operates at greater than 500 tons because of lack of need for pig—has the following dimensions: Hearth, 22 ft.; bosh, 25 ft. 6 in.; height, from tap hole to top platform, 94 ft. 10 in. The coke unit consists of a 47-oven underfired Koppers-Becker battery and has an annual daily capacity of 1050 net tons of coal.

Blast Furnace Charge

Because of the relatively lean quality of ore available, the ore-to-coke charging ratio of the blast furnace is 2.40:1. From 1690 to 1750 lb. of coke and 1150 lb. of limestone are charged per ton of pig, with a total slag volume of 1500 lb. Ore sources, analyses, proportion of ore used from each source, and freight rates to Houston are indicated in Table III.

The flow sheet of the ore treatment plant at the South Basin mine consists of: (1) Jaw crusher to 4 in.; (2) log washer; (3) screen, with minus ½ in. going to classifier and oversize to cars. Ore treatment at North Basin mine is similar except that fines are screened out at the shovel before going to the crusher, and following the log washer, ore passes a picker belt. Both mines are open pit with large shovels loading trucks carrying about 8 tons each. Over-burden is slight. Mine buildings are of temporary construction, and total mining costs probably are under $1 per ton.

The coal situation is less favorable. The mining operation, with labor scarce, has constituted an operating difficulty. Mines at McAlester and McCurtain, Okla., were opened up by a DPC agent to supply jointly Sheffield and Lone Star Steel. On Dec. 1, 1944, Sheffield took direct responsibility for the mining operation. Prior to that time the coal was billed f.o.b. mine at $3.40 per ton. Freight to Houston is $2.05. Coke recovery per ton of blended coal is approximately 69 per cent, and the grade of coke has been satisfactory. The coal cost might be reduced somewhat during a peace time operation by shipment from Birmingham, where coking coal is available for approximately $2.00 per ton, plus $1.50 per barge haul.

Limestone is secured from quarries at Ogden and New Braunfels in west Texas which involves a freight charge of approximately 72c.

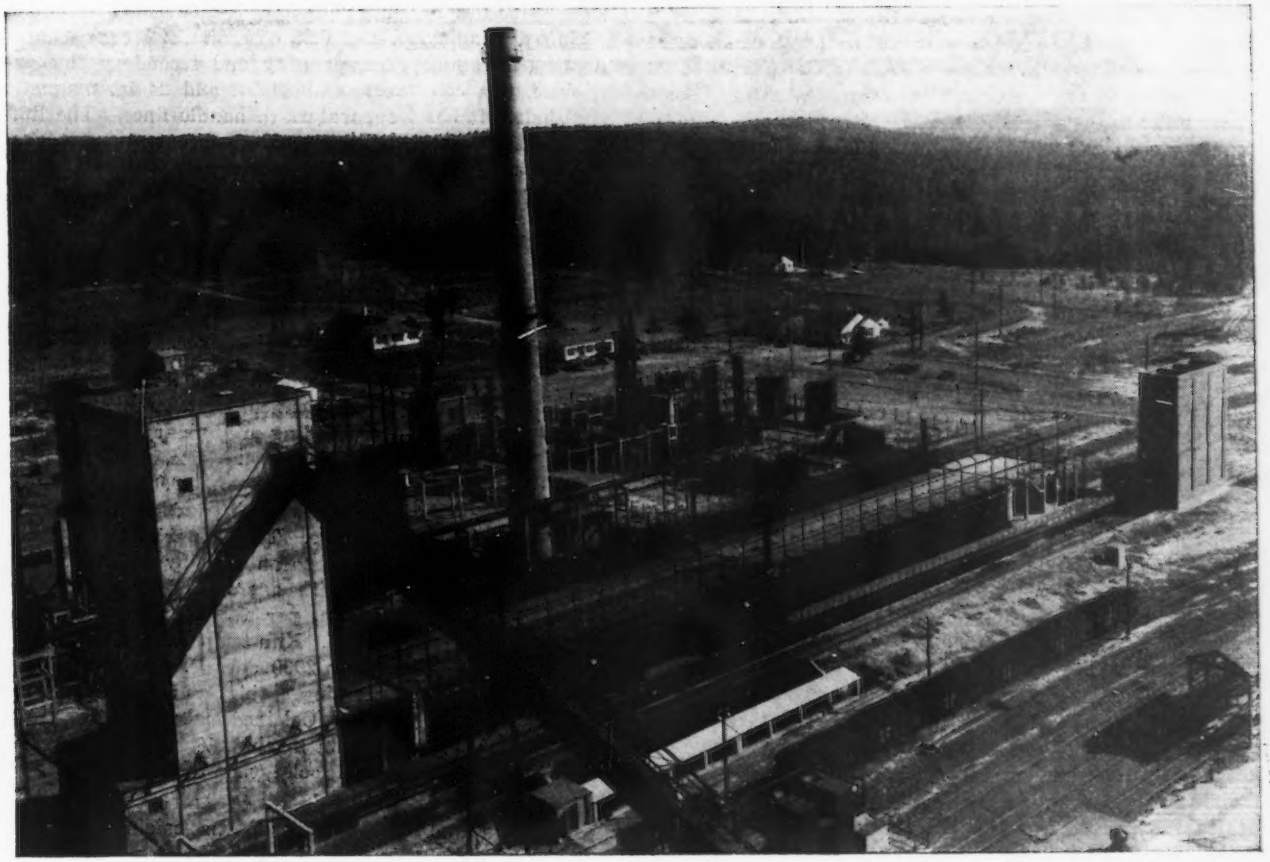
Manganese ore is secured from Mexican sources. A pyrolusite, it analyzes approximately 34.16 per cent Mn, 3.25 per cent Fe, with 0.14 per cent P and 20 per cent insolubles.

The open hearth charge during the

TABLE II

Breakdown of Capacities of Sheffield Steel of Texas (Houston Plant) (Net Tons)

Capacities	Original Plant	DPC Addition	Total
Ingot Capacity	203,000	304,000	507,000
Typical Distribution of Finished Products			
Wire	25,000		25,000
Plates	30,000	216,000	246,000
Structurals	50,000		50,000
Bars	60,000		60,000
Total finished products	165,000	216,000	381,000
Individual Product Capacities			
Wire	30,000		30,000
Plates	60,000	216,000	276,000
Structurals	100,000		100,000
Bars	120,000		120,000
Totals	310,000	216,000	526,000



LONE Star's 78-oven coke unit operated intermittently during 1944 and is still held under heat. The plant's iron ore deposits lie in the piney East Texas hills in the background.

war period has been approximately 60 per cent scrap.

Even if the mines, coke ovens, and blast furnace do not fit into Sheffield's postwar picture, the company has, through the affiliated Kansas City plant, experience in using close to 100 per cent scrap charge dating from 1918.

The Kansas City company also operates a 65 ton scrap-fed open hearth and bar mill at Sand Springs, Okla., during normal times.

Steel Production Permanent

The Sheffield Houston plant, planned and commenced before the war, should not be regarded as a war baby in any sense of the word. In its local advertising, Sheffield emphasizes that "steelmaking is permanently and deeply part of Texas and surrounding states." Remembering that pig iron production is not a necessary adjunct to steelmaking, and considering the probable postwar market pattern, it is not difficult to map the plant's probable course. Heavy emphasis will be placed on merchant products, and the wire and fence plant will be a more important factor. Quite possibly the 110-in. DPC plate mill will be sloughed off, leaving a potential plate capacity of 60,000 tons annually, ample to take care of the company's immediate market. With the return to billet reinforcing steel and large construction projects, probably that item will be important, as is the case with other operations of this type. Despite the substantial Texas tubular market, the specialized mass production character of pipe production would not seem to make it practicable for an operation of this size. However, with a probable excess of ingot over finishing capacity, if the DPC plate mill is not purchased, attention may be given to forging billets.

The Texas market does not yet seem large enough in itself to support a continuous strip mill, and in this regard it must be remembered that Sheffield is an integral part of the American Rolling Mill Co. Thus, for the time being, it would seem more likely that Sheffield could serve as a warehousing and distributing agent for Armco products, using its sales organization to advantage. With docks recently completed at Houston, nothing is to prevent economical vessel and/or barge shipment from Armco's Ashland, Ky., mill.

Entirely apart from consideration of the Texas market area, Houston over the long term may loom larger in the American steelmaking picture. Although it lacks the backyard market enjoyed by Sparrows Point, its tidewater location affords approximately the same flexibility of access to raw materials and Latin American markets. For that matter, the products of a large Houston mill conceivably could appear on the West Coast in the same satisfactory manner as do those from the Maryland mill. These possibilities will be magnified as production costs rise in the Birmingham district.

Lone Star Steel Project

Eliminating entirely the political aspects which have been ruminated *ad nauseam* from the Texas oil fields to the halls of Congress, the Lone Star Steel project provides fascinating technical considerations to those interested in ore beneficiation and some questions to be pondered by market research men even if it never produces steel. The Lone Star blast furnace and coke plant is located near Daingerfield, Texas, in the northeast corner of the state, near the mines

from which it secures its ore. Longview, at the head of the east Texas oilfield, is 40 miles to the south, Dallas 125 miles to the west, and Houston 230 miles to the south.

A steel man roaming through the piney east Texas hills, who came upon the Lone Star plant unexpectedly probably would experience very much the same sensation as an archeologist roaming through the Mexican jungles who found a vast city unmistakably built by the early Romans. This wilderness anomaly is as fancy as any in the United States as far as it goes (through the pig iron stage), and presents some ore beneficiation processes entirely new to this country.

The Lone Star ore beneficiation plant is adjacent to one of the larger North Basin Eocene deposits estimated by the company, upon the basis of pitting and drilling, to contain sufficient proven ore to provide 27,500,000 long tons of 55 per cent concentrate. Indicated deposits in the east Texas area vary from 67,500,000 to 200,000,000 tons of ore, available by surface mining. About 60 per cent of the available ore is siderite ($FeCO_3$) and 40 per cent limonite ($2Fe_2O_3 \cdot 3H_2O$). To the writer's knowledge, no other commercial pig iron operation in the United States at this time utilizes a carbonate ore, for calcining is required prior to charging in the blast furnace, although such ores are commercially used abroad. Complicating the situation, the ore body is heavily interspersed with gangue material. Overburden is light, however, averaging about 4 ft., and thus can be stripped with a dragline shovel. Below the sand overburden lies a bed predominantly limonite, ranging from zero to 20 ft. in thickness (average: about 8 ft.). This contains inclusions of blue shale and brown clay, drawing down the bed run iron content to 28-38 per cent. Separating the limonite from the siderite usually is a bed of Bancroft shale ranging up to 10 ft. in thickness. The siderite occurs in discontinuous beds or kidneys ranging from 2 to 30 ft. in depth (averaging 20 ft.). Like the limonite, this contains inclusions of blue shale. It has an iron content of 18 to 27 per cent. Some hematite also is present. The siderite rests on a base of Queen City sand.

Because the area in which the deposit occurs is elevated, substantial portions of the ore body are visible as outcrops. However, it is obvious from the discontinuous nature of the ore beds and variation in iron content that intelligent selective mining is necessary to a successful operation even though all the ore is accessible by shovel. Mining costs originally were estimated, per ton of concentrate obtained, at $1.00 for the limonite and $1.80 for the siderite, to which must be added another $1.05 for calcining, not including capital charges. Actual operations have indicated that these figures will be bettered.

Mine Near Ore Plant

The site of mining operations is about 1.2 miles from the beneficiation plant to which the ore is hauled by truck. Segregation of siderite and limonite is made as mined.

The physical and mechanical characteristics of the beneficiation plant make it an engineer's dream. Structures are all steel frame with brick walls, and all equipment was purchased new specifically for this installation.

The beneficiation commences in the crusher building, divided into two interchangeable material flow sections. One section is commonly designated the siderite side, the other the limonite side, each having a 500 tons per hr. rated feed capacity. However, the flow sheet of both sections is almost identical through crushing and washing, and both are currently engaged in siderite beneficiation. See chart.

The siderite then passes to the sink-float plant of which the basic units are a 7 ft. 6 in. diameter cone separator, primary and secondary thickeners, and 36 in. and 24 in. magnetic separators to handle fines. The limonite "sink" concentrate analyzes (wet) approximately 46-47 per cent Fe, 0.02 per cent S, 0.1 per cent P, 14-15 per cent SiO_2 plus Al_2O_3 and 9.55 per cent moisture. Both siderite and limonite fines are sintered in a 46 ton per hr. Dwight-Lloyd unit.

On the siderite side a calcining unit has a feed capacity of 63 tons per hr., with provision made for later erection of an identical unit. After washing and grading preliminary to calcining, the siderite analyzes approximately 43.5-44 Fe, 0.2-0.3 S, 0.09-0.11 P, 10-11 SiO_2 plus Al_2O_3 and 6-10 per cent moisture. This material is fed from storage to an 11½ by 300 ft. rotary kiln with a slope of approximately 7/16 in. per ft. rotating from 0 to 1 r.p.m. Kiln temperature is approximately 2000 deg. F. at the hot end, providing a highly reducing atmosphere. Calcined material passes from the kiln to an 11½ by 126 ft. water cooled cooler, then to a storage pit for loading.

Analysis of the calcined siderite is approximately 63.64 per cent Fe, 0.02-0.03 S, 0.13 per cent max. P and 10-12 per cent max. insolubles.

The capacity of the beneficiation plant is rated at 3000 tons of concentrate daily, and has run as much as 2000 tons. Concentrates from this plant have been utilized by blast furnaces in the St. Louis district and in the Birmingham district. In March, Republic Steel Corp. signed a contract for 100,000 tons of concentrates to be shipped at the rate of approximately 25,000 tons monthly to its Birmingham and Gadsen, Ala., blast furnaces. This high grade concentrate should continue to have a ready market both as blast furnace and open hearth ore, particularly as the Birmingham ore situation becomes less favorable.

TABLE III

Ore Resources and Use
Sheffield Steel of Texas

Percentage of Total Ore Charge	Source	Freight Rate	Average Analysis (Natural), Per Cent						
			Fe	SiO_2	Al_2O_3	P	Cu	Mn	Moisture
10-25	Durango, Mex.....	$1.88*	62	11	3.5	0.60-0.75	T	0.028	2.0
20-33	North Basin (Linden, Tex.)....	1.72	46	11	3.5	0.085	T	T	6-8.5
65-70	South Basin (Jacksonville, Tex.)	1.28	41.5-43	11	8.5	0.25-0.3	T	T	6-8.5

* Rate from Mexican border—Mexican freight borne by seller

Blast Furnace and Coke Ovens

The Lone Star operation involves a 4-mile down hill rail haul from the beneficiation plant to its blast furnace. The 1200-ton stack never has been blown in, but daily charge ratios are estimated as follows:

2400 to 2700 tons of ore
1000 to 1200 tons of coke
700 to 1000 tons of limestone
4200 to 5100 tons of air

Daily slag run is estimated at 900 tons.

The by-product coke plant consists of 78 Koppers-Becker underfired ovens with a daily charging capacity of 1734 tons. A coke recovery of 73 per cent

is estimated. A portion of the battery operated intermittently during 1944, and approximately 30,000 tons of furnace coke was produced in anticipation of blowing-in the blast furnace. This has since been sold and shipped, approximately 11,000 tons being used by Carnegie-Illinois in the Chicago district. The by-products plant also has been completed.

Coal, as previously indicated, comes from the same Oklahoma mines which supply Sheffield, but freight to Daingerfield is only $1.20 per ton plus tax compared to $2.05 to Houston. Cost at mine is about $3.40. Thus, the use of a higher ratio pig charge at Lone Star is comparatively more economical than at Sheffield, using coal from this source. Limestone is to be secured from Chico, Texas. Mining cost is roughly estimated at 70c. per ton, plus $1.00 freight.

Daily by-product production is estimated at 17,340,000 ft. of gas, 17,340 gal. of tar, 34,680 lb. ammonium sulphate, 4630 gal. benzol, 867 gal. toluol, and 200 gal. xylol.

Story Behind Plant

Only by diligent pick and shovel work into the reasoning of its sponsors over the past several years can it be understood why this plant happens to be located here. Much of this reasoning is foreign to conventional steel industry thinking, although Bethlehem is reported to have looked over the ore properties over a quarter century ago, and there has been no great clamor to buy the plant from the DPC.

Financial control of the Lone Star Steel Co., which persuaded DPC to advance the money to build the plant, lies with about two dozen grass roots Texans—utility, bank, and insurance company officials, attorneys, and one or two manufacturers. Probably no single man owns more than 10 per cent of the company's $500,000 common stock although John W. Carpenter, president of the Texas Power & Light Co., spearheads the group. The balance of the $1,000,000 working capital was financed through banking channels.

Flushed with the optimistic civic aggressiveness spurting with oil riches in east Texas during the past decade, this group became interested in subtantial low grade iron ore deposits in the northeast section of the state which had been kicked around without any particularly likely use for the past half century. (In all that has been written about the Lone Star project practically no mention is made of Texas as one of the most abundant scrap producing states in the nation or of the relationship of scrap to steel making on a modest basis.) From the beginning, the Lone Star project was painted with grand, sweeping gestures, and large scale steel production meant pig iron.

Great as was the wealth of the oil country, its greenbacks were not of the denomination to build a large fully integrated steel plant. The steel expansion program sired by defense and war needs answered this problem. After either heavy political pressure or none at all—there is a wide range of opinion on this matter—Defense Plant Corp. advanced $26 million to develop mines, build an ore beneficiation plant, 1200-ton blast furnace, and a by-product coke plant at the site of the ore deposits near Daingerfield, Tex., and $5 million to develop coal mines in Oklahoma which also would serve the Sheffield project. The Texas backers understood that approximately $35 million more would be forthcoming to provide balancing raw steel capacity and finishing facilities.

If DPC has specified that the steelmaking and finishing facilities be constructed first, the plant probably even now would be producing a respectable tonnage of steel with scrap as melting stock, although possibly not on the scale planned. To understand why DPC did not build the steel plant first, and at least prime it with scrap, it is necessary to recall the pig iron shortage of early 1942 when the project was approved. Nationally, scrap was scarce, and housewives were contributing their old bedsprings and enamelware to the cause. Early Axis war successes magnified the possibility of putting the Soo locks out of commission, thus strangling production of the northern steel centers. Moreover, air attacks on British steelmaking facilities offered the possibility that the United States might have to furnish pig iron as well as semi-finished and finished steel to the United Kingdom. At any rate, pig iron came first in the steelmaking process and today the site of the Lone Star Steel works and rolling mill stands barren, the blast furnace and coke ovens stand idle, and the ore beneficiation plant is in only partial production. The basic flow sheet of the plant as it would have been constructed is indicated in the large chart.

Oil Country Market

With Sheffield already in the picture catering to the general store steel needs of the merchant trade, and the mill's Daingerfield location some distance from previously established distribution centers, attention in selecting a product range gravitated to the steel-hungry oil fields. The biggest of them all, the east Texas field extends to Longview, just 40 miles from Daingerfield, which, incidentally, is the starting point for the "Big Inch." After some consideration, Lone Star hitched its wagon tightly to the oil and gas industry. Finished product capacity specified was 240,000 tons of electric-weld 2 to 14-in. pipe, 40,000 tons of forging blooms, and 140,000 tons of plates, with some thought of postwar cast iron pipe manufacture. It is notable that the nation's total production of electric-weld pipe in 1941 was 805,250 tons. The plans did not include tricky-to-manufacture seamless tubing, the heavy tonnage item in the oil country, because of obvious technical difficulties involved and the difficulty in recruiting skilled and experienced men during wartime.

In setting up these capacities, Lone Star considered that its market area embraced the entire Pacific Southwest with some possibility of Latin American trade. It was felt that the mill would have access to the entire Texas and Oklahoma markets plus 50 per cent of Louisiana, 75 per cent of Arkansas, 30 per cent of New Mexico, 70 per cent of Kansas, and 35 per cent of Missouri. On this basis Texas would constitute about 65 per cent of the market, tonnage-wise. The proposed product range, since the finishing facilities never have been built, still is subject to further consideration, of course.

The broad proposition in pushing this layout is typified in a speech by Congressman Wright Patman, a Congressional enthusiast for the project:

"There is no steel plant in the north that could produce steel and deliver it to the consuming points in the Southwest as cheaply as can be done from Daingerfield. To contend otherwise is to start a controversy with arithmetic."

With the plant committed to the Daingerfield location because of the ore, thus eliminating the possibility of partial peacetime operation based on scrap more abundant in other parts of the state, and with the oil industry selected as the most likely customer, the marketing plan pivoted on serving as many oil producing areas as possible. From the standpoint of arithmetic, Congressman Patman's idol, the Daingerfield location looked made to order. Not only were the East Texas fields next door, but the rail distance to Oklahoma, Louisiana, Arkansas, New Mexico, and Kansas

wells was impressively less than that from the steelmaking districts of the North. Harking back to the previous relationship of steel distribution in Texas to railroad rate structures and truck and water hauling, and attempting to translate this proposed Lone Star marketing area into available markets weighted upon the basis of railroad rate structures, simple arithmetic seems far less dependable as a basis for making plans. Far-western boosters for Geneva are frank in their appraisal of the effect of possible railroad rate changes upon its future, but so far the Lone Star officials have not campaigned for adjustment.

Freight Rate Theory

"On the basis of present rates," one thesis ran, "steel shipped to principal Texas consuming centers from outside industry would average $16.30 a ton, whereas the average rate from Daingerfield would be $7.89. It is estimated that the new mill would save southwestern customers more than $4 million annually in freight rates alone." That particular argument apparently failed to take into account the large tonnage of oil country goods normally entering Texas by water in which actual transportation cost, far lower even than published rates, is the dominant factor or a considerable freight absorption borne on products hauled by rail. Decreasing production costs accruing from large scale near capacity operation are also important. Another point advanced was that the rate on structural steel (which the plant would not make anyhow) shipped from Birmingham to Dallas was 75c. per cwt., but would be less than half that from East Texas points to Dallas. Whatever the logic of this arithmetic, sales records of other companies show that Dallas is no great shakes as a steel fabricating center in Texas, and it might take some time for it to become one.

Some of the preliminary market studies fell into the pitfall of lumping all steel products in one chunk, weighing this tonnage on the basis of population in the market area, and coming to the conclusion that, because this area had a smaller proportion of total steel production than the proportion of population to the rest of the country, it was a fertile territory for making steel. Such thinking, of course, failed to give sufficient weight to minimum capacities for each product necessary to economic operation.

The late John V. W. Reynders, who in years previous had pointed to the present site of Geneva as the ideal location at which to manufacture steel for the Pacific Coast, and whose engineering achievements were many, voiced the opinion that "this won't be the only steel plant in this area. . . . Texas and surrounding states are ripe for a steel mill. The market is here. There is no question of being able to sell the steel once it is made," and complained that the West Coast had received authorization for steel capacity twice that of the Daingerfield plant to serve two million fewer persons.

At least two of the people intimately connected with the Lone Star organization had in the past been associated with Bethlehem Steel, noted for its so-called "tidewater policy," but the importance of accessibility to water transportation as the balancing factor in the steel distribution picture of the Southwest, seems to have been given only secondary consideration. The dominating concept in locating the plant appears to have been *physical* proximity to raw materials and markets. Possibly important in the plant's future is a proposal, which could easily be a part of vast postwar floor control projects, to make navigable the Red River from Jefferson, about 25 miles from the plant, through Shreveport, La., to the Mississippi River at the Mississippi-Louisiana border.

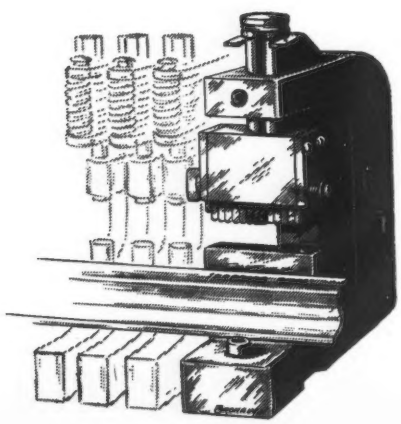
If the prior history of the project has been rocked by the rapidly changing war situation, deaths of key officials, political reverses (Jesse Jones, Donald Nelson and Franklin D. Roosevelt all have left the Washington scene) have not helped.

Capital Charges Important

Aside from factors discussed above, capital charges made against production will bear importantly on costs. Amortization of the ore beneficiation plant, for instance, would impose a staggering burden on ore costs if computed on the basis of actual construction costs. This would be true to a lesser degree of the blast furnace and coke plant which, though thoroughly modern, are comparable to other industry installations. The DPC has repeatedly indicated its willingness to take into account high wartime construction costs in pricing of plants.

There is no longer much question as to the metallurgical soundness of the Lone Star plant. Beneficiated ore produced by Lone Star has been used satisfactorily at other plants. Coke produced from coal of the same origin as contemplated by Lone Star has been proven in steady operations by Sheffield, and coal coked at Daingerfield has been used elsewhere. There is every reason to believe that this coke is sufficiently strong to support the larger blast furnace burden imposed by Lone Star.

If private capital can be convinced of market possibilities there is always the chance that rolling mill facilities can be picked up as war surplus from some other plant and open hearths installed. Until such a time the bulk of the plant stands idle in the wilderness.



TWO operations have been combined so as to permit an appreciable saving in time due to the development of a new multipunch numbering device at Consolidated Vultee Aircraft Corp., San Diego. The device was designed for attachment with a press brake, like Strippit punch units, and its function is to stamp part numbers automatically while holes are being punched, thus eliminating a subsequent numbering operation. An adjustment on the device enables operators to make quick and positive allowances for various material thicknesses.

SETUP CHARTS

For Automatic Screw Machines

. . . In the third article of the series, speed and feed change gear charts as well as high speed drilling and tapping gear ratios are presented for 1⅝ in. 6 spindle New Britain-Gridley screw machines. The whole series, to be concluded next week, includes charts for Acme-Gridleys, Conomatics, Davenports and Brown & Sharpes.

By JOHN J. MEADOWS

Development Engineer,
Development Division,
Curtiss-Wright Corp.

THE New Britain-Gridley screw machines are somewhat similar to the Acme-Gridleys described in the first article of the series, except that combination cross slides are used and only one feed cam is provided. This cam actuates the main tool slide directly and the cross slides indirectly through crank levers. Since these crank levers have different moment arms, the resultant feed produced by each lever is different from the others and from the main actuating cam as well. Because of this, the charts for these machines are slightly more complicated than those previously presented. The machines have two spindle speed ranges provided by two change sprockets furnished in the motor drive. In the 1⅝ in. 6-spindle machine, which is charted in this series, these sprockets have 73 teeth and 47 teeth for high and low speed drives respectively. There are two ranges of 41 steps each provided for variations in feed, one using a 3 in. main tool slide cam and the other using a 6 in. cam. The setup charts are used as follows:

The main setup chart, Fig. 18, is entered along the left hand margin at the desired spindle speed and the horizontal line followed to its intersection with one of the two spindle speed curves and the nearest encircled dot selected. The proper change gears for this spindle speed will be found at the bottom of the vertical line through this intersection. The feed is selected along the right hand side of the main chart and the change gears found from intersecting the feed line at the effective cam curve. This is the feed obtainable on the main tool slide using a 6 in. cam. Effective feeds at respective cross slides can be obtained by referring to the right hand portion of the chart. The effective feed at the main tool slide is referred to the right to its intersection with the 6 in. main tool slide curve. From this intersection the vertical line is followed to its intersection with the various tool slide curves and these intersections referred to the feed scale which gives the respective feeds directly. For the 3 in. main tool slide cam, the feed obtainable on the main tool slide cam is referred to the 6 in. tool slide curve and from its intersection, the vertical line is followed to its intersection with the 3 in. tool slide curve. From this second intersection, the horizontal line is followed to its intersection with the 6 in. main tool slide curve to obtain the correction for using the 3 in. cam. From this point the selection of feeds is accomplished as previously described for the 6 in. cam.

Example Worked Out

For the New Britain screw machine chart, Fig. 18, let it be assumed that it is desired to run the spindles at 2000 r.p.m. and that a maximum of 0.010 in. feed per revolution is desired. The chart is entered along the left margin at 2000 r.p.m. and the horizontal line followed to its intersection with the spindle curve with the encircled dots. The nearest attainable speed is either 1950 or 2075 r.p.m. Either may be selected depending upon the circumstances to be met. If 1950 is chosen then the vertical line through the intersection indicates the 79/53 tooth change gear combination. If 2075 is selected the chart indicates the 81/51 tooth combination. The chart also indicates that the 73 tooth sprocket should be used on the motor. This establishes the requirements for the spindle drive.

Let us assume that the feed cam will have a ½ in. rise or feed range. If everything is satisfactory it would be a simple matter to follow the 0.010 in. feed line to its intersection of the ½ in. curve. This would indicate a 73/59 tooth feed change gear combination.

But the circumstances are not that simple. The feed must first be checked against the curves on the right hand side of the chart. Let it be assumed that the main cam has a 6-inch overall rise. If the chart is entered at 0.010 in. feed the horizontal line is followed to its intersection with the 6 in. main tool slide curve. This is the main reference curve of this section of the chart and all determinations are made from it. The vertical line through the above intersection is traced upwards to its intersections with the cross-slide curves. These intersections indicate a 0.0107 in. feed on the upper front form tool slide, a 0.0122 in. feed on the upper rear tool slide, and a 0.013 in. feed on the lower cross slides. That indicates a 30 per cent overload on these tools and will undoubtedly lead to tool troubles. Two things are possible to correct this: Either the main tool slide feed must be reduced or a 3 in. cam substituted for the 6 in. cam.

Second Trial

If the main tool slide feed is to be reduced the process is as follows: The lower tool slide curve should be traced from the 0.013 in. feed intersection down to its intersections with the 0.010 in. line. The vertical line through this 0.010 in. intersection is then traced to its intersections with

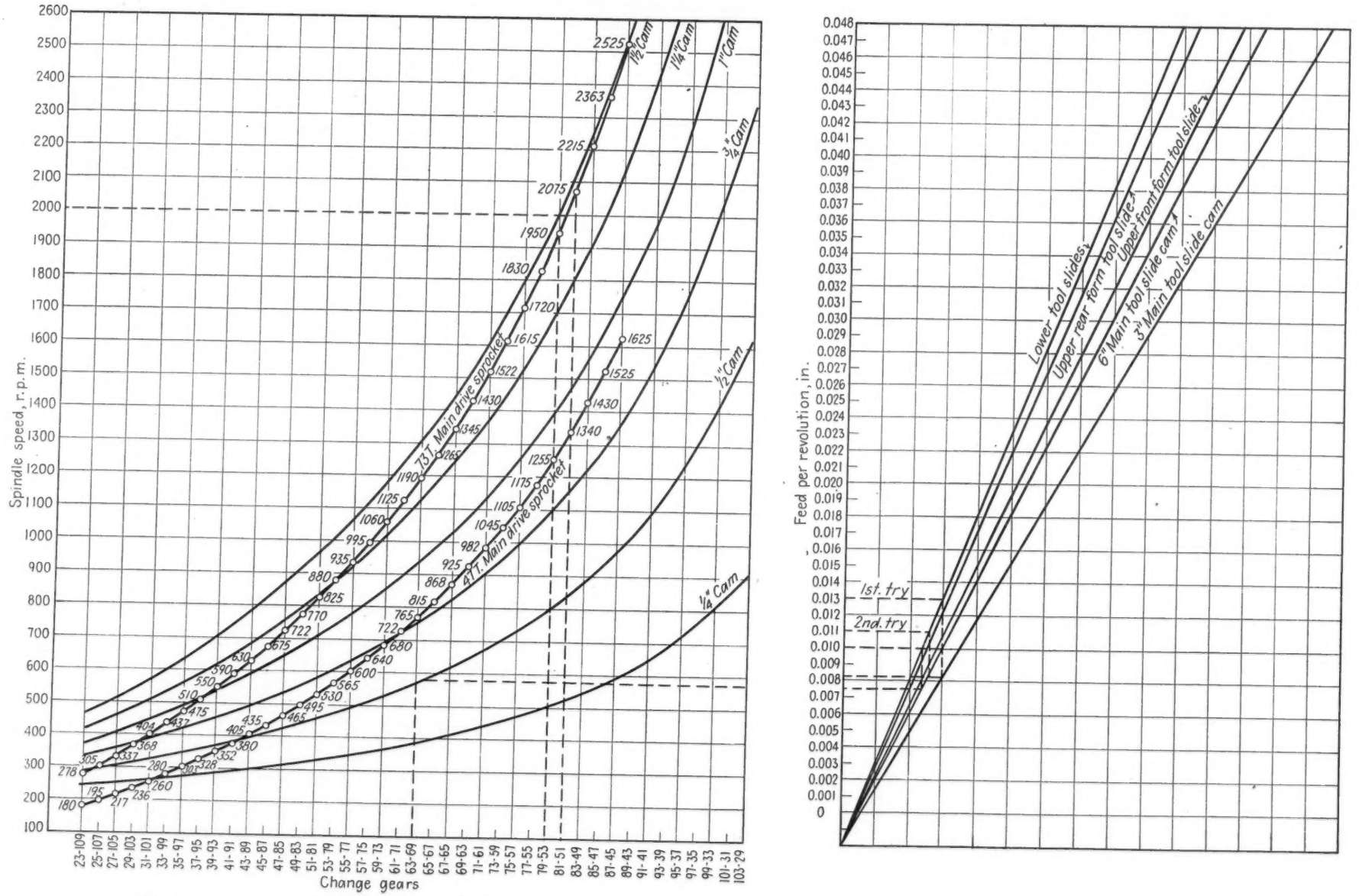


FIG. 18—Change gear setups and proportionate tool slide movements for 1 5/8 in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.

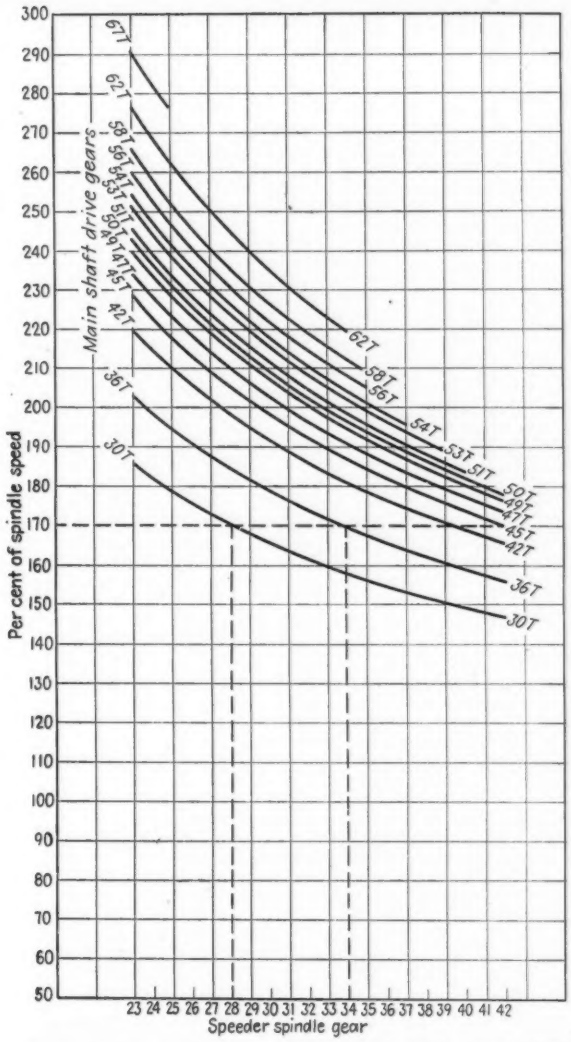


FIG. 19—Per cent of speed chart for high speed drill spindles for 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.

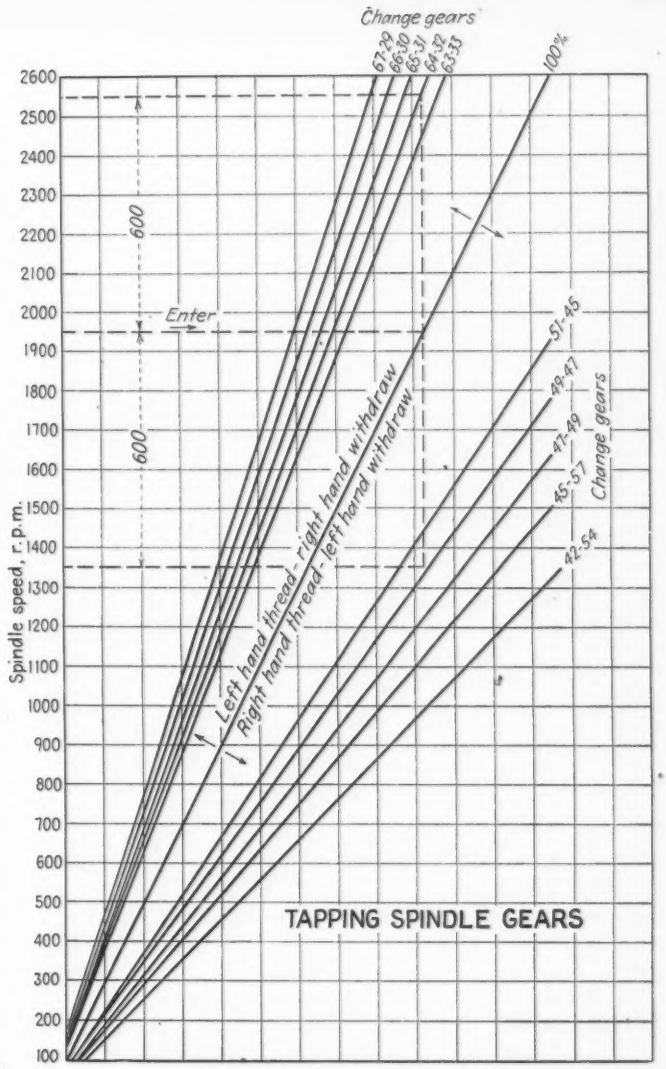


FIG. 20—Tapping spindle gears for 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.

FIG. 18—Change gear setups and proportionate tool slide movements for 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.

the other tool slide curves. These indicate 0.0093 in. feed for the upper rear tool slide, 0.008 in. feed for the upper front tool slide, and 0.0075 in. feed for the main tool slide cam. This 0.0075 in. feed line is then traced to the ½ in. cam curve, the nearest intersection of which indicates a 63/69 tooth gear combination.

If the 0.0075 in. feed is too slow and a 3 in. cam is decided upon the trace is made from the original 0.010 in. feed intersection with the 6 in. main tool slide curve down the vertical line to its intersection with the 3 in. main tool slide curve. This indicates an 0.0083 in. feed on the main tool slide. Transferring our trace along the 0.0083 in. feed line to the 6 in. main tool slide the vertical line through this new intersection is then traced to determine the feeds on the cross slides. These indicate 0.009 in. feed on the upper front slide, 0.0103 in. feed on the upper rear slide, and 0.011 in. feed on the lower cross slides. If 0.011 in. feed is satisfactory for the tools in those cross slides the trace is then followed back to the 6 in. curve where it originated at the 0.010 in. feed line and that line followed to its intersection with the ½ in. cam curve. This indicates a 73/59 tooth gear combination as originally considered. The difference being that in this last case a 3-inch main tool slide cam was used.

Drilling Problem

For high speed drill spindles, the percentage speed chart, Fig. 19, is used from which the percentage is selected representing the ratio between the main spindle speed and the speed of the high speed drill spindle as was described for the Conomatics. The per cent of speed chart is then entered at this percentage and the proper gears selected from the intersection of this line with the intersection of the vertical and sloping gear curves. Those points where all three lines intersect are the ones desired.

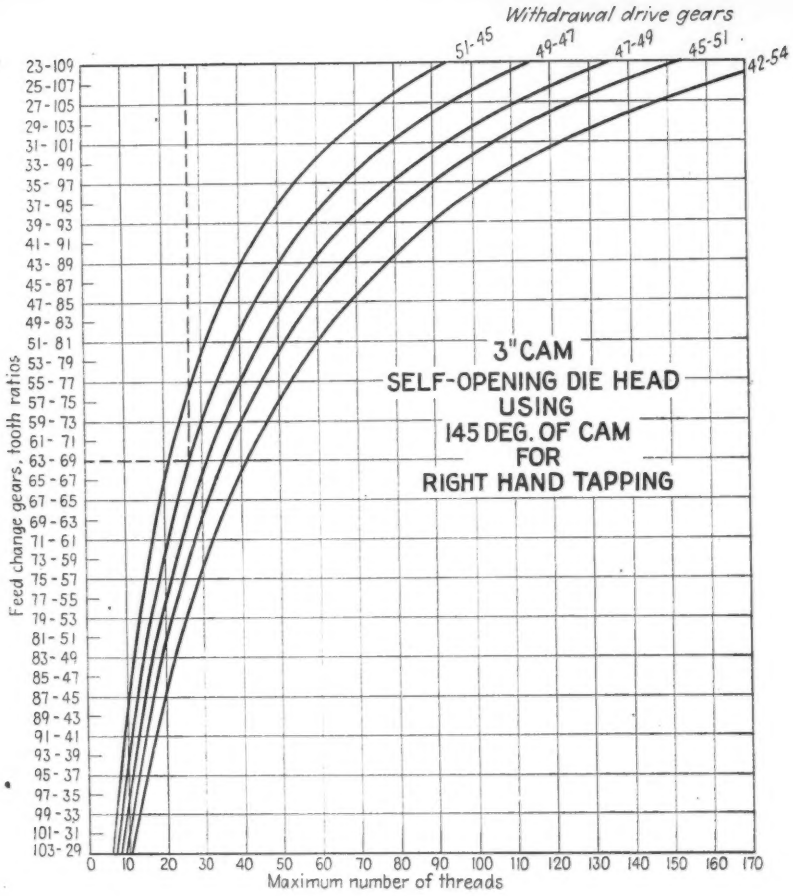
Let it be assumed that the main spindles are rotating at 1000 r.p.m. and that a cutting speed of 2700 r.p.m. is desired at the drill periphery. Since the spindles will rotate in opposite directions the actual speed of the drill spindle will be

$$2700 - 1000 = 1700 \text{ r.p.m.}$$

This represents

$$\frac{1700}{1000} \times 100 = 170 \text{ per cent of the main spindle speed.}$$

If the chart, Fig. 19, entitled "per cent of speed chart for high speed drill spindles" is entered along the left margin at the point coinciding with 170 per cent and the horizontal line traced it will be found that the curves are intersected at four points. Any of these intersections will give the de-



LEFT

FIG. 21—Maximum possible number of threads with self-opening diehead using 145 deg. of cam for right-hand tapping on 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.

sired results. For example, let it be assumed that a 30 tooth gear is available for driving the speeder spindle. If that gear is used as the driver on the main shaft a 28 tooth gear will be required on the speeder. If a 36 tooth driver is used as indicated by the next curve a 34 tooth driven gear on the

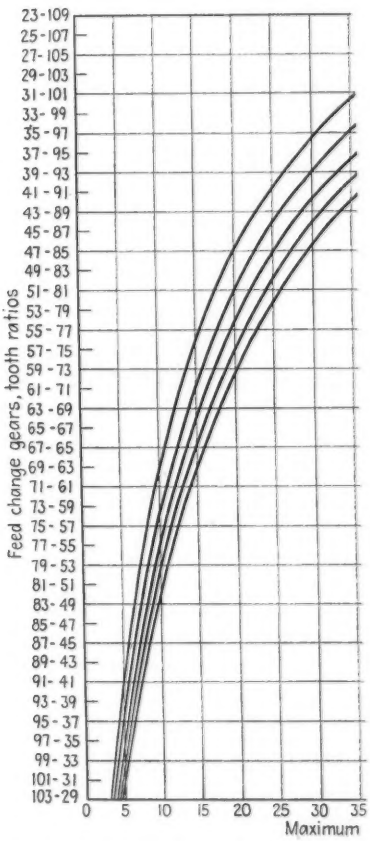
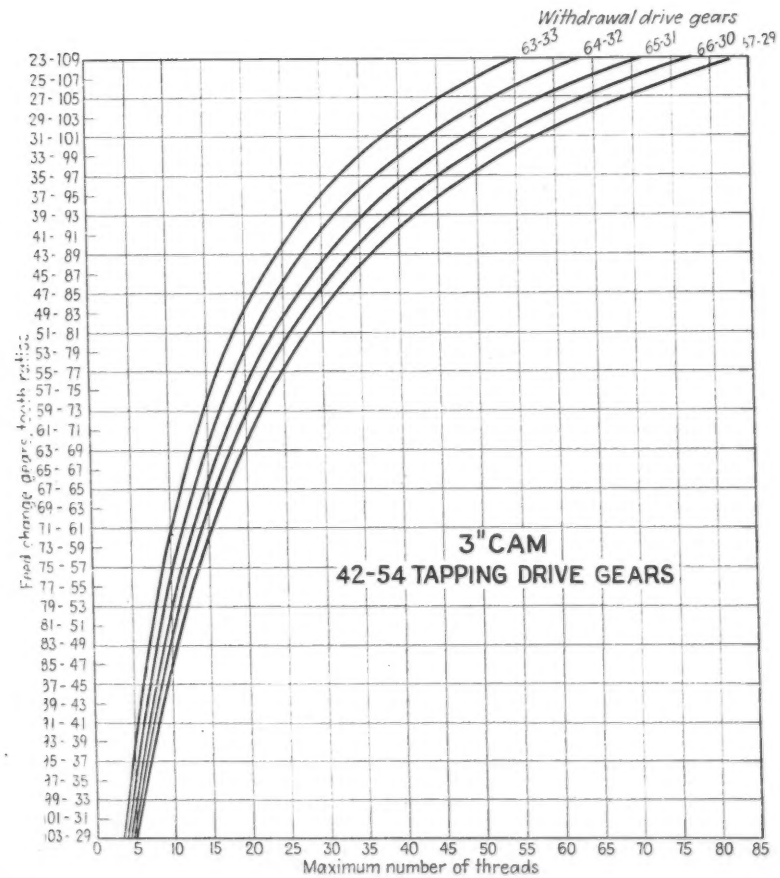


FIG. 23—Maximum possible number of ment allowing 12 deg. for reversing and on 1⅝ in. x 6 spindle New Britain-Gridley

speeder will give slightly less than the required speed.

Tapping Charts

For tapping, the tapping spindle gear chart, Fig. 20, is provided. It is entered at the main spindle speed and referred to the 100 per cent curve. From this intersection the vertical line is followed a distance equivalent



LEFT

FIG. 22—Maximum possible number of threads with reversing tapping attachment, allowing 12 deg. for reversing and 42-54 tapping drive gears on 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machine.

RIGHT

FIG. 24—Maximum possible number of threads with reversing tapping attachment allowing 12 deg. for reversing and using 47-49 tooth tapping drive gears on 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.

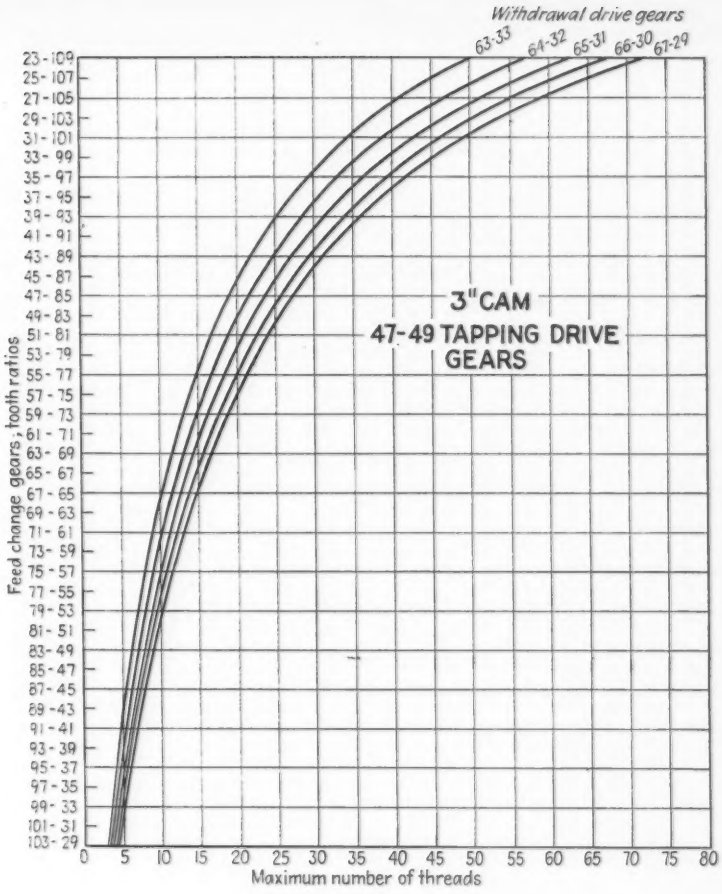
to the desired cutting speed and the nearest gear curve selected for threading. To assist in selecting the proper withdrawal gears, another set of charts are provided giving the maximum number of threads for each gear combination, Fig. 21-26. The particular chart to be used is the one cor-

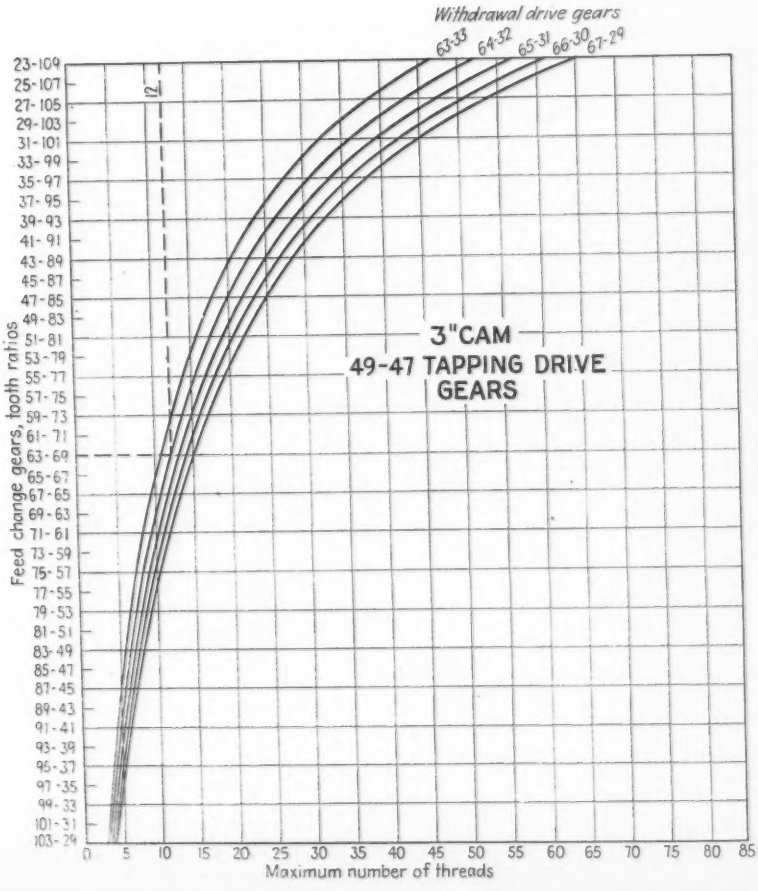
threads with reversing tapping attachusing 45-51 tooth tapping drive gears Model 61 automatic screw machines.

responding to the tapping gears being used and the chart is entered at the point corresponding to the feed change gears installed in the machine. The horizontal line through this point is followed to its intersection with the vertical line corresponding to the number of threads desired. The curve next adjacent to this intersection and

RIGHT

FIG. 25—Maximum possible number of threads with reversing tapping attachment allowing 12 deg. for reversing and using 49-47 tooth tapping drive gears on 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.





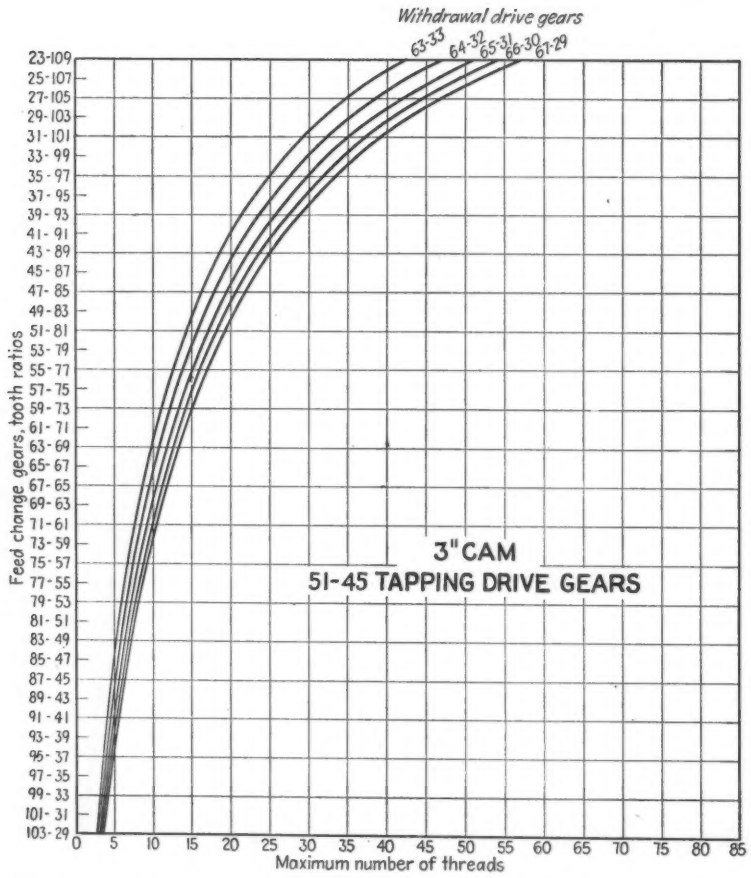


FIG. 26—Maximum possible number of threads with reversing tapping attachment allowing 12 deg. for reversing and using 51-45 tooth tapping drive gears on 1⅝ in. x 6 spindle New Britain-Gridley Model 61 automatic screw machines.

on the right of the intersection indicates the most desirable withdrawal gears to use. If no curve occurs to the right of this intersection a different cutting speed or a different feed will have to be selected. These can be determined from the charts by visual analysis.

Example Worked Out

Let it be assumed that the main spindles are rotating at 1950 r.p.m. using the 79/53 tooth spindle change gear selection. Let it be further assumed that the main tool slide is operating on a 0.0075 in. feed with the 63/69 tooth feed change gears in place. If the thread to be cut is ⅝ in. diameter R.H. and the material requires a cutting speed of 100 ft. per min., a tapping speed of 600 r.p.m. will be required. To determine the correct setting the tapping chart, Fig. 20, should be referred to and it should be entered along the left margin at 1950 r.p.m. The corresponding horizontal line should be followed to its intersection with the 100 per cent curve. The vertical line through this intersection becomes the reference line for further considerations.

Since a 600 r.p.m. cutting speed is desired the vertical reference line is followed down to 1350 r.p.m. (1950 — 600). The nearest tapping spindle curve indicates a change gear selection of 49/47 teeth. This will give a tapping speed of 610 r.p.m. A 600 r.p.m. withdrawal speed can be obtained by following the vertical reference line to 2550 r.p.m. (1950 + 600). This indicates a 64/32 tooth change gear combination for the withdrawal gears.

This data can now be checked to determine the maximum number of threads obtainable with the combinations selected. If a self-opening die head is to be used, reference is made to the corresponding chart, Fig. 21. The chart is entered along the left margin at the point corresponding to the change gears in the main feed drive, in this case 63/69. (See problem worked out in Fig. 18.) The corresponding horizontal line is followed to its intersection the 49/47 tooth drive gear curve. This indicates a maximum of 27 threads.

If a reversing die head is to be used, reference is made to the corresponding chart, Fig. 25, entitled "Maximum possible number of threads with reversing tapping attachment using 49/47 tapping drive gears." This chart must be selected for either a 3 in. cam or a 6 in. cam depending upon which cam is being used.

Let it be assumed that a 3 in. cam is being used. The 3 in. cam chart is then entered along the left margin at the point corresponding to the 63/69 tooth feed change gears in the main drive. The horizontal line is then followed to the curve corresponding to the 64/32 tooth withdrawal gears. This indicates 12 threads.

Test For Static Conductive Belts

AN easy method to determine whether any rubber V-belt, flat belt, hose or other product is static conductive has been developed by technicians of the B. F. Goodrich Co., which was among the first to develop rubber compounds which conduct static electricity. Static conductive rubber belts have proved especially valuable in many phases of war work, particularly in operations where a static spark might set off a fire or explosion.

For the test, a 5 or 6 ft. length of lamp cord with standard rubber socket plug, a 2-watt Neon bulb, two ordinary clamps or metal prongs and two insulated handles are required. One of the wires of the cord is cut, the Neon bulb inserted in a standard base, the insulated handles installed near the end of each wire and the prongs or clamps attached to the wires.

To make the test, part of the belt or other rubber product is moistened with water, leaving a dry section 8 to 12 in. long between the moistened surfaces; the testing assembly is then plugged into any 110 volt a.c. line, and the clamps or prongs applied to the moistened surfaces. If the bulb glows, the rubber product is a static conductor. The belt or other article under test must be suspended in the air between the clamping points, or rest on a table or other surface which has been insulated so it is non-conducting.

Cork Blanket For the Hydropress

. . . Hydrocork, developed by Armstrong Cork Co. engineers for hydropress forming of aircraft parts, is now offered as a low-cost tool material for general sheet metal forming. It performs differently than rubber since there is relatively small lateral expansion when a block of this material is subjected to as much as 50 per cent compression.

A MAJOR application of Hydrocork, a new special type of cork composition manufactured by Armstrong Cork Co., Lancaster, Pa., is its use as a forming medium in combination with the typical hydraulic press forming die. Hydrocork has great compressibility and since it transmits pressure to the work in straight lines, it does not need to be confined as in the case of the all-rubber pad. The greatest working pressure is over the die, where the greatest compression of the Hydrocork occurs. With a total pressure applied remaining constant, the unit pressure over the die is increased, while the unit pressure around the die is decreased.

Since the potential energy in Hydrocork is in proportion to its compression, the section over the dies has a very high unit of pneumatic pressure. As the metal stretches into the cavity, the cork expands and follows the metal to the bottom of the cavity with a very slight loss in pressure. This concentration of power over the die will properly form parts of heavier gage metal than is possible with an all-rubber pad, it is claimed. See Fig. 1.

The cork granules used in making Hyrocork are joined into a uniform structure by a special binder. The unusual cellular structure of cork is responsible for its high compressibility characteristic. Each of the minute cells contains air and trapped by thin, strong cell walls. Air within the cells accounts for more than half of the cork's bulk.

The uses of Hydrocork fall into three general categories: (1) As a forming medium in conventional hydraulic press operation, Hydrocork opens some new uses for the hydraulic press. (2) In the manufacture of draw dies, it eliminates to large extent the need for the complicated conventional forming die and pressure pad. (3) In the manufacture of punch press blank and pierce dies, it is used in the place of rubber or mechanical strippers.

Because of its straight line compression, Hydrocork will generally permit more uniform application of pressure than is usually possible where rubber alone is used. However, a 1-in. rubber sheet is frequently used over the Hydrocork to protect the face of the material and to permit a local lateral flow over the part, where necessary, to form return flanges joggles and other shapes. It has been Armstrong's own production experience that the combination Hydrocork-rubber pad involves the use of a box with a minimum depth of 6 in. This box may be made of 6 x6 x ½ in. structural steel angle, welded with suitable reinforcing ribs to a base or backup plate ¼ in. thick. In this box, Armstrong uses 4 in. Hydrocork pads and a 2 in. rubber facing of 60 to 65 Durometer (see Fig. 2). Such a box can be welded in a few hours and requires little or no machining.

On punch presses an advantage of Hydrocork is reduction in tool costs. The original tool does not require either the number of labor hours or the workmanship necessary for conventional dies. Some mechanical parts are eliminated from the design, and the "self-centering" action of a Hydrocork supported draw cushion reduces the need for precision alinement of the punch and die (Fig. 3). Development work and experience by the Armstrong Cork Co. on this application also point to decreased maintenance costs and shorter set-up time.

The adaptation of Hydrocork to

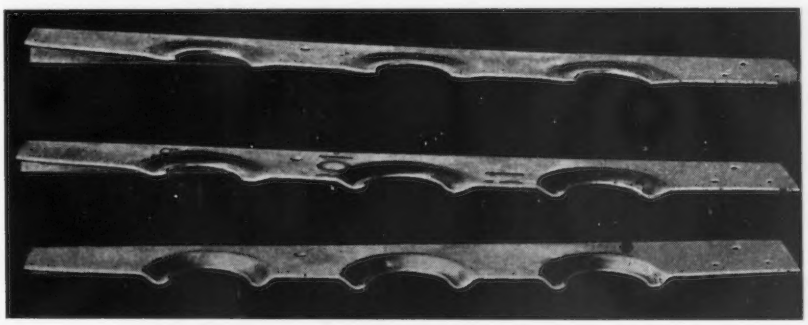


FIG. 1—Results using the conventional rubber press pad compared with Hydrocork on R-301W sheet 0.051 gage are shown in these examples. (Top) Use of a conventional rubber press pad with 4000 lb. per sq. in. pressure on the ram of the press. (Middle) Forming with the Hydrocork pad at 1500 lb. per sq. in. (Bottom) Fully formed beads obtained with the Hydrocork pad at 3500 lb. per sq. in.

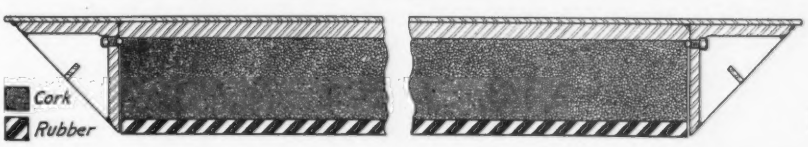


FIG. 2—Hydropress construction with Hydrocork in combination with a rubber pad used to protect the face of the cork composition.

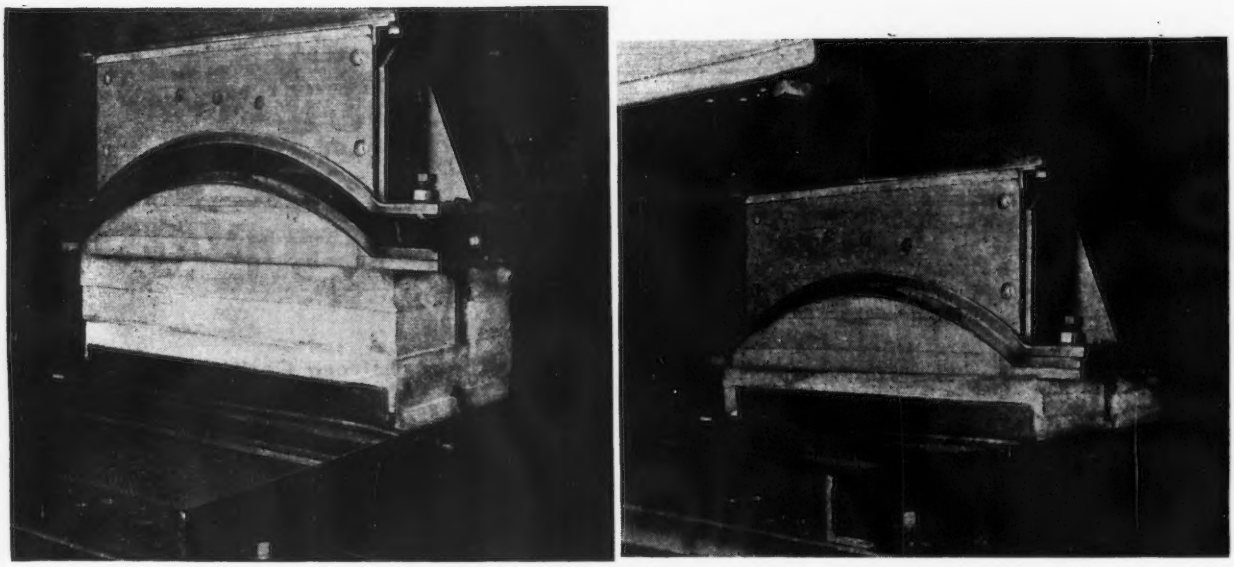


FIG. 3—Open and closed positions of draw die with Hydrocork pressure plate. Notice the complete lack of any retaining box for the Hydrocork. Note also that at 50 per cent compression Hydrocork shows no inclination to side-flow.

hydraulic press forming and drawing dies for larger pieces of difficult contour and deep draws, not only bring about savings in tool costs but permits quality production parts. This material can be counted on to give consistent results where the compression factor of the cork does not exceed 50 per cent, the company states. Under these conditions tool design permits considerable flexibility because different densities and thicknesses of Hydrocork may be located in the die to give an actual pressure variation not easily obtainable with supplementary systems (Fig. 4). Other advantages are the greatly decreased setup time and the opportunity of utilizing a single action hydraulic press for production of parts usually requiring a multiple-stage press. Not readily susceptible to fatigue, Hydrocork retains its resilience. Form dies as used on the hydraulic press, are particularly adaptable to the production of pieces commonly known as drop hammer or stretch press jobs.

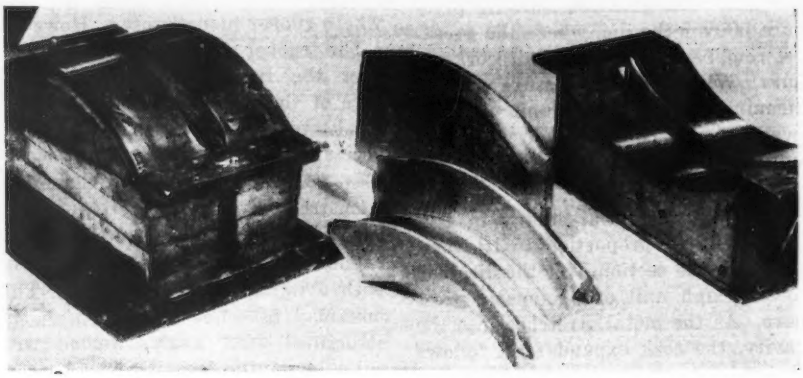
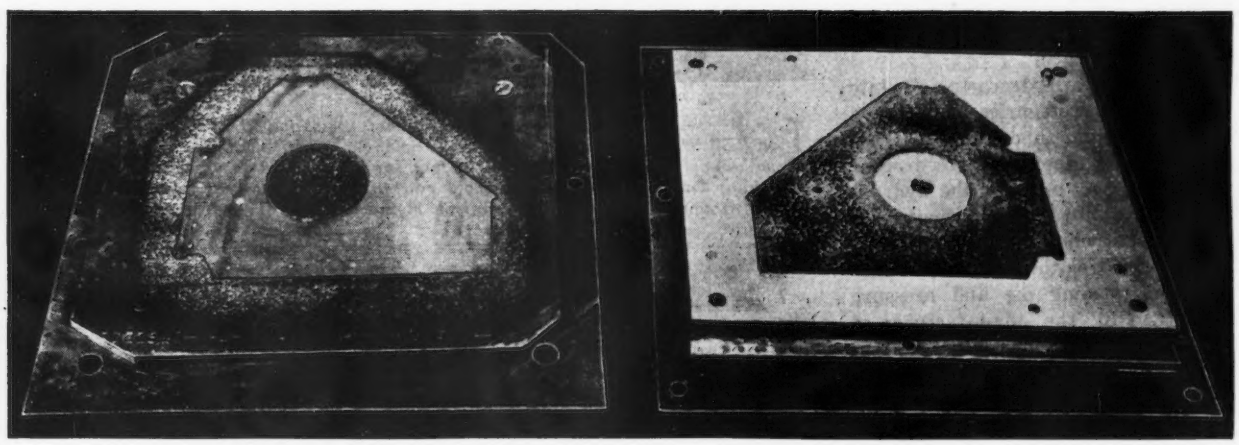


FIG. 4—From left to right—the pressure plate mounted on Hydrocork as the pressure medium; the cast die proper (normally locked to the base plate mounting the pressure ring); and the draw plate. In front is the tip skin as it comes from the die and also as it is trimmed for assembly.

One of the simplest and most direct uses of Hydrocork is to replace rubber or mechanical strippers in the construction of conventional punch press blank and pierce dies, Fig. 5. Certain production advantages, it is

(CONTINUED ON PAGE 138)

FIG. 5—Illustrating the application of Hydrocork as a stripping medium in the construction of punch press blank and pierce dies.



A Spot Test For Molybdenum in Steel

. . . The advantages of spot tests lie in their savings of time, money and material but such tests should be approached as a screening procedure and not as a substitute for quantitative chemical analyses. The simple test for determining the molybdenum content of alloy steels described herein was first developed in 1940 and has ben in continuous use in several government stations since that time. The procedure is simple and requires no elaborate setups in equipment and chemical reagents.

o o o

By W. H. HAMMOND
Berkeley, Calif.

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THE purpose of the spot test is to achieve not only economy of material and time, but to enable the metallurgist to identify from one to several thousand metal shapes under conditions that require severe economy of manipulation and equipment. Although spot tests have been published which require laboratory apparatus ranging from a test tube to a micro funnel, it is here proposed to limit the test to the special needs of the physical metallurgist who cannot always depend upon having an analytical laboratory where he needs it.

This spot test may be described as a quick field identification by means of a chemical color reaction, taking place solely in one spot of material on the sample, on paper or on a spot plate, wholly at room temperature, without need for any other apparatus or reagents than cannot be contained in a simple test kit.

The history of spot testing shows that the spot test has not always been so restricted. Fritz Feigl in his "Manual of Spot Tests,"[4] defines the term, perhaps from the standpoint of the laboratory chemist rather than the metallurgist. On page 21, he writes: "The first and most evident objective of spot test analysis is the microchemical detection or identification of small quantities by means of a simple procedure .... Every analytical laboratory frequently can replace the laborious operations of the usual methods of qualitative analysis by simple spot reactions."

During the course of a study of reported color reactions for molybdenum, an effort was made to find a true spot test of improved sensitivity for this element in alloy steel. A test was developed based upon the red molybdenum cinchonine - thiocyanate complex precipitate of Johnson[1] which gave superior results. However, besides reporting the details of this test, a brief review will be given of the results of the whole study for what value it may have.

Books by Feigel[3, 4], Mellan[5], Yoe and Sarver[6], and the Merck Index[7] give some color reactions for molybdenum. Smith and West[8] published general material of value. Gutzeit[9] discussed some color reactions for metals, including molybdenum, in minerals.

Certain of these color reactions, which may or may not be capable of development into spot tests, are of interest because they employ chemical reagents generally found in the ordinary laboratory stock room. Thioglycollic acid, for example, was suggested for molybdenum by Hamence[10] and cochineal by Szebelledy and Jonas[11]. Cacothelin, more familiar as a reagent for tin, was recommended by Beck[12] and Rosenthaler[13]. Shemyakin and Belokin[14] employed the common cobalt reagent, alpha-nitroso-beta-napthol, for molybdenum. Alpha-alpha-prime bipyridyl was suggested by Komarovskii and Polvektov[15]. These tests have never, apparently, gained much popularity.

Other color reactions for molybdenum have been subjected to considerable study and recur repeatedly in chemical and metallurgical publications, in fact frequently without credit to previous workers. For example, the thiocyanate test is one of the oldest of these[16]. The Spiegel and Maass test[17] employing phenylhydrazine seems to have given good results in some applications if not in steel testing. A spot test for molybdenum using tungstic acid was recommended by Bertrand[18] and Getzov[19]. Probably the fullest literature for any of these tests is that for potassium xanthogenate or xanthate recommended by Feigl[20], Koppel[21], Malowan[22], Petrov[23], Panchenko[24], Leiba and Shapiro[25] and Clarke and Hammence[26].

Some of these reactions offer excellent possibilities for further experimentation by spot testers, but the author obtained the best results by adapting a spot technique from Johnson's gravimetric precipitation of molybdenum thiocyanate upon cinchonine as a reddish-orange precipitate[1]. The effect of securing the test indication as a precipitate is to concentrate the color and increase the sensitivity, and thereby to increase the certainty of the test upon low moly steels.

Reagent Kit

The test kit consists of four 1-oz. bottles, at least three of them glass stoppered, taped together with adhesive. The bottles are numbered, on the adhesive. One piece of glass stirring rod, a few pieces of coarse sand paper for cleansing steel surfaces, a box of filter paper (quantitative for retentivity) and a small porcelain spot plate, size 0000, 3 depressions, such as Braun-Knecht-Heiman No. 53371, complete the kit.

Bottle No. 1 contains 8 volumes of concentrated nitric acid and 10 volumes of water. Bottle No. 2 contains 25 per cent potassium thiocyanate. Bottle No. 3 contains a solution made up by dissolving 3.5 grams of stannous chloride, $SnCl_2 2H_2O$, in 2 ml. 1:1 HCl and diluting to 10 ml. with water. Two ml. of 7 per cent cinchonine (Merck), dissolved in 1:1 HCl are added and the reagent is allowed to stand over night. If the cinchonine has entirely dissolved, more dry crystals are added to maintain sufficient excess of the reagent to produce a clearly discernible orange precipitate with molybdenum in the test. A very small fragment of granular tin is

added to keep the stannous chloride reduced.

Occasionally this solution requires more cinchonine. The only rule is to add enough crystals in periodic small additions to keep it working properly.

Bottle No. 4 contains tap water, renewed frequently, for rinsing the glass rod and the spot plate.

The spot plate is preferable to the paper for tests on forging, plate and tube steels, with molybdenum below about 0.4 per cent. Drill rods and heat resisting steels, suspected of being high moly, are best given a preliminary screening by the test on paper.

Because of the low concentration of element, that is 0.1 to 0.4 per cent in most cases, in forging and NE steels, a piece of circa 0.15 per cent moly steel for a control, must be run simultaneously with the spot tests upon the group of unknown samples. If an 0.08 per cent moly steel is suspected, extreme care, several check tests and considerable experience are mandatory.

Small areas upon the blank, control and sample steels are cleaned and brightened by sand paper. Then 1 to 2 drops, depending upon size, of Solution No. 1 are placed upon each area with the test rod. The rod is then dipped into Solution No. 4 for rinsing, and wiped dry (paper). After initiation of attack upon the steels, as shown by vigorous bubbling, 10 sec. are counted, that is "one thousand and one, one thousand and two, etc.," and then the liquid is transferred by rod from each spot to a depression on the tile or a spot upon a clean filter paper. As much of the liquid should be transferred as possible by repeated application of rod, but the rod must be rerinsed every time it is changed from one liquid to another. If the rod is flattened a little on the lower end it will hold more solution per application.

Perfect Technique Required

The reason for insistence upon minor details of the procedure is the necessity for achieving flawless technique in locating molybdenum in the lower ranges.

One to two drops of Solution No. 2 is then applied to each spot upon the porcelain or paper. By this means both ferric iron and the trace of molybdenum are changed to the highly colored thiocyanates.

One to two drops of Solution No. 3 are then applied to each spot.

The following results can be expected. The spot from the blank (no moly) is decolorized. If the porcelain was used, a few flecks of a *white* precipitate of cinchonine complex will be present.

The control spot must show a few flecks of an *orange* precipitate of molybdenum - cinchonine - thiocyanate, free from the more purple ferric thiocyanate. If the latter is not completely decolorized, add a little more of Solution No. 3. The depth of the color upon the flecks depends upon the amount of moly present.

The sample spots will (a) resemble the blank, (b) show some orange but less than the control, (c) resemble the control, (d) show much more molybdenum than the control. If either (b), (c) or (d) results occur, the test should be repeated and, if checked, the steel as a rule sent to the laboratory for exact chemical analysis for molybdenum content.

Addition of more Solution No. 2 will increase the insolubility of the molybdenum compound and increase the sensitivity of the test[1].

At the completion of a test upon the porcelain spot plate, it is wiped thoroughly with paper and rinsed; then rewiped before another test.

Tests upon porcelain are more trouble in the field since cleanliness is so necessary. A dirty plate cannot be thrown away after one test. Upon the other hand, paper filters hold ferric thiocyanate and offer more difficulty in securing thorough bleaching; and give inferior sensitivity.

Using Feigl's system for rating a spot test[27] the following data (with porcelain) were secured with this technique:

Mass sensitivity ..... 0.06 gamma
Mass sensitivity, omitting cinchonine .....0.12 gamma
Concentration sensitivity 1:830,000

It would seem that the use of cinchonine about doubles the mass sensitivity.

A special study was made of the limits of applicability of the test, and of the effect of possibly interfering elements commonly occurring in alloy steels, by applying the test to the following list of Bureau of Standards analyzed steels. The results are shown in the last column below.

A positive identification could be made by spot plate upon the three molybdenum alloy steels in this list. The steels that contained around or less than 0.01 per cent Mo gave no test.

Rice and Yerkes[28] claimed that tungsten and vanadium interfered with the formation of molybdenum thiocyanate. Possible interference with this spot test was investigated by mixing fluid from a droplet upon No. 50a, containing tungsten and vanadium, with No. 106 containing molybdenum. No interference could be detected.

Several warnings should be given and emphasized. The threshold of sensitivity of the test is obviously somewhere between 0.15 and 0.01 per cent. It is believed that the exact detection of some listed molybdenum steels, with Mo 0.08 per cent, would have to depend more upon the experience and care of the tester than any other factor. No steels of that type are available to the author for study.

The second warning is that Solution No. 3 contains organic reagent the stability of which cannot be guaranteed. If the directions are followed, however, and a control test always run, the tester will receive ample warning that more cinchonine should be added, or the whole Solution No. 3 be replaced.

A third warning has been excellently phrased by Pulsifer[2]. "There is no substitute for the quantitative chemical analysis to be made on a representative sample by competent analysts." A spot test is essentially a screening procedure. Its evidence is to be used by the metallurgist, or metallurgical chemist, with a correct valuation. If not overvalued, it can save considerable time, money and wastage of alloy.

The author developed this test in its present form about 1940. It has been in continuous use at several government stations since that time.

Steel	Cr	Ni	V	W	Mn	Cu	Mo	Results
50a	3.52	0.05	0.97	18.25	0.29		0.01	No color
32b	0.64	1.21	0.01	....	0.62	0.12	0.01	No color
30c	0.98	0.08	0.24	....	0.71	0.10	0.01	No color
33b	0.03	3.49	0.01	....	0.70	0.11	trace	No color
73	13.93	0.07	0.03	....	0.28	0.03	0.01	No color
101	17.56	8.44	0.04	....	0.56	0.06	0.01	No color
100	0.18	0.15	0.01	....	1.38	0.12	0.01	No color
65a	0.18	0.24	0.01	....	0.75	0.18	0.01	No color
106	1.29	0.13	0.01	....	0.48	0.14	0.16	Gave test
72a	0.66	0.03	trace	....	0.60	0.08	0.20	Gave test
111	0.27	1.75	trace	....	0.66	0.12	0.22	Gave test

References

[1] C. M. Johnson, "New Method for Determining Molybdenum in Alloy and Plain Carbon Steels," THE IRON AGE, July 13, 1933, p. 16. (Abs.) Chemical Abstracts XXVII, 4189.

[2] Pulsifer, "Inspection of Metals,"

(CONTINUED ON PAGE 138)

Control of Distortion In Arc Welding

. . . After reviewing the effects of heat on steel, Mr. Morrill lays down three simple rules for controlling distortion and interprets them in terms of specific "Do's" and "Don't's". This article is written in simple language for the practical welder. In a later article, an analytical approach to the same subject will be presented by another author.

o o o

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o o o

AMONG the arc welding problems that have been of greatest interest to metal fabricators is that of preventing and controlling distortion. There have been many misconceptions regarding this problem, some of which have been related to the subject of residual stress. Yet in most cases the problem of controlling distortion in any given product or structure can be solved easily by the application of a few basic rules.

Before discussing these rules, it is well to review the effect of heat on steel. If an ordinary steel bar, for example, is heated thoroughly and uniformly throughout its entire volume, expansion in all directions will take place. Provided this natural expansion is entirely free and unrestrained, the bar will reach the size indicated by points *a-b-c* and *d* in Fig. 1. Allowed to cool evenly without restraint of any kind, the bar will contract to its original shape and size, *A-B-C-D*, *without* distortion.

However, if the two ends of the bar are placed in a vise, Fig. 2, and the bar is heated uniformly, expansion towards the ends will be prevented and the expansion can occur only laterally. The result of displacement of metal within the bar is now apparent when it cools and contracts. The bar is shorter and thicker as shown in Fig. 3.

FIG. 1—When not constrained, a bar of steel expands equally in all directions.

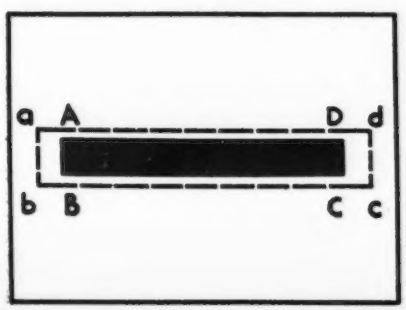
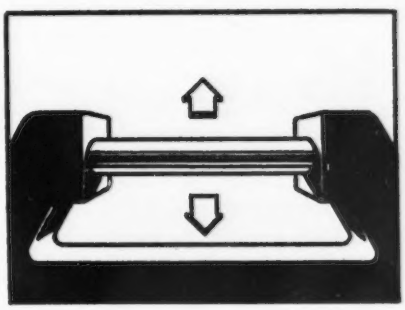


FIG. 2—When constrained endwise, a heated bar can only expand laterally.

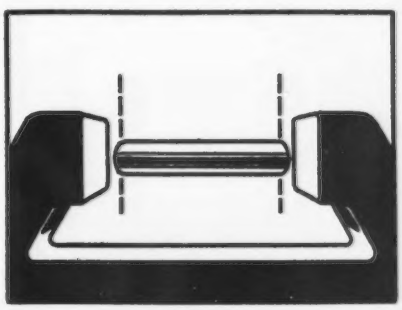


Instead of heating the bar uniformly throughout, suppose the heat is applied only to one side. In this case, expansion is localized and uneven. The surrounding cool metal prevents or hinders expansion in all directions except on the surface, so that the displacement of metal occurs there. See Fig. 4. When that area starts to cool and contract, a certain amount of this original displacement becomes permanent, causing an uneven contraction throughout that entire area. The natural cohesion of the metal causes an overall adjustment, and in a bar of these proportions, the contraction force is greater than the natural resistance of the bar itself. The result is distortion. See Fig. 5.

Several such steel bars treated in this way, laid side by side, may be compared to a steel plate of the same thickness. Thus, the principles of the effect of heat on the steel bar apply also to plates, Fig. 6.

Applying this principle to a simple welding job, assume that two plates are to be joined with a butt weld. As the weld is applied, heat of the molten weld metal, plus the heat of the arc, is transmitted out into the surrounding areas, causing considerable uneven expansion. As the weld progresses, the molten weld metal begins to cool and contract immediately, but at the same time, the heat of the arc causes considerable expansion ahead of this contraction. It should be understood that while the weld metal is cooling, and therefore contracting, the temperature of the sur-

FIG. 3—Upon cooling, the bar contracts. Restraint has resulted in longitudinal upset.



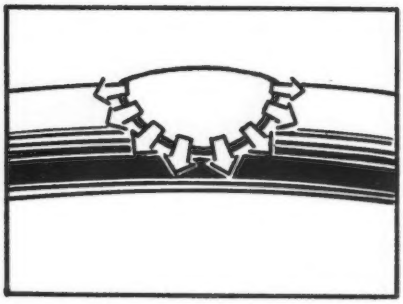


FIG. 4—Localized heating of a bar as in arc welding.

rounding plates is rising and therefore the plates are expanding. See Fig. 7. As the plates themselves cool, they also contract.

If expansion and contraction on this particular welding operation are allowed to occur without any control, distortion results. Three simple rules can be followed which will aid materially in the prevention and con-

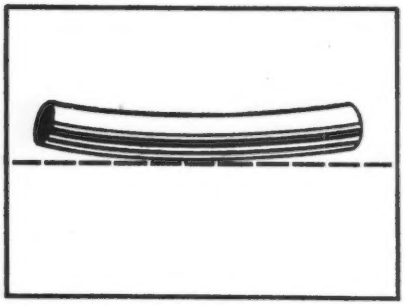


FIG. 5—Distortion of the bar shown in Fig. 4, following cooling.

trol of distortion. In many cases, the application of one of the rules will be sufficient. In others, a combination of the rules may be required. They are as follows:

Rule I—Reduce the effective shrinkage force
Rule II—Make shrinkage forces work to reduce distortion
Rule III—Balance shrinkage forces with other forces.

Rule I. REDUCE THE EFFECTIVE SHRINKAGE FORCE.

(a) *Do not overweld.* Addition of excess weld metal—not needed to meet the service requirements of the joint—is known as overwelding. This causes distortion as shown in Fig. 8 and contributes nothing to the strength and performance of the joint. Hence, it actually is a waste of time and money. Weld metal should be kept at a minimum, consistent with the service requirements of the joint.

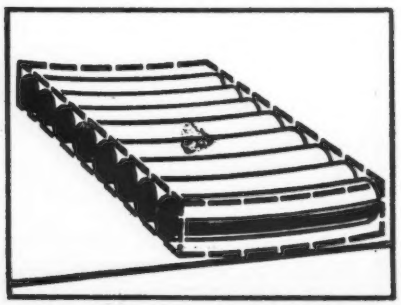
Another way of stating this principle is: Use as little weld metal as possible and make an intelligent use of the weld metal that is needed. For a conventional fillet weld for a T-joint, it is known that the strength is determined by the effective throat, Fig. 9. There is an excess of weld metal above the line *A-A* that does not increase the strength, but obviously increases the effective shrinkage force. Less shrinkage force may be obtained with no loss of strength by using the deep fillet technique, Fig. 10. In contrast to the conventional weld, the deep penetration at the root of the fillet, using the deep fillet method, gives 15 per cent more strength with the use of 30 per cent less deposited metal. Less weld metal means less distortion.

(b) *Use proper edge preparation and fit-up.* It also is possible to reduce the effective shrinkage force through proper edge preparation. To obtain the proper fusion at the root of the weld with a minimum of weld metal, the bevel should not exceed 30 deg. Proper fit-up also is important, so the plates to be welded should be spaced 1/32 to 1/16 in. apart. A minimum amount of weld metal then will be needed to produce a strong joint.

(c) *Use few passes.* (See Fig. 11). This is another way to make an intelligent use of weld metal. Distortion in the lateral direction always is a major problem on plates that are free to move. Use of one or two passes with large electrodes reduces distortion in this direction. In general, lateral distortion is approximately 1 deg. per pass.

In some cases, however, distortion in the longitudinal direction is a problem and then, due to the greater ability of a small bead to stretch longitudinally (compared to a large bead), the number of passes should be increased rather than decreased. This apparently paradoxical relationship is a function of the thickness of the plate and its natural resistence to distortion. There is inherent rigidity against the longitudinal bending of a plate, providing the plate is thick enough. Light gage sheets have little rigidity in this direction

FIG. 6—A plate may be considered as made up of a number of bars.



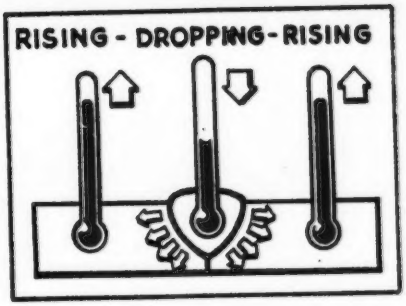


FIG. 7—When the weld metal is cooling, the adjacent plate rises in temperature.

and therefore will buckle easily. Unless the two plates to be welded are restrained, there is no lateral rigidity whatsoever, since each of the two plates is free to move angularly with relation to one another; so lateral distortion is more common.

(d) *Place welds near the neutral axis.* Another means of reducing the effective shrinkage force is to place

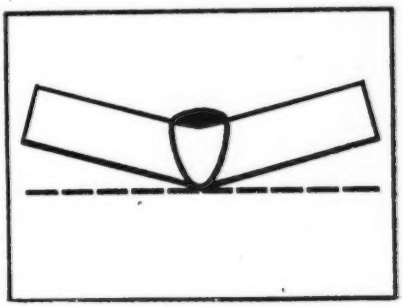
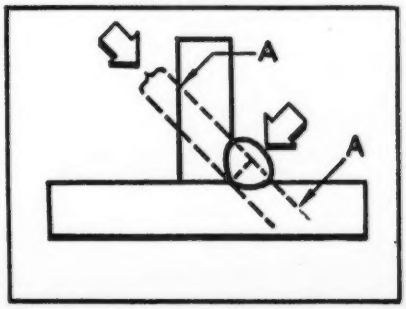


FIG. 8—Overwelding causes distortion.

the weld as close as possible to the neutral axis. In a conventional fillet weld, for example, the weld is so far from the neutral axis that it has sufficient leverage to pull the plates out of alinement. Use of the deep fillet method places the weld close to the neutral axis which reduces the leverage, Fig. 12.

(e) *Use intermittent welds.* To further reduce effective shrinkage force by minimizing the amount of weld metal, intermittent welds may be

FIG. 9—Excess metal is seen above the throat line A-A.



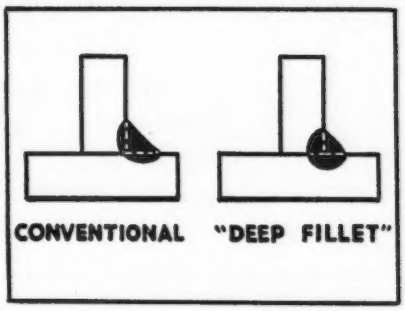


FIG. 10—Conventional and deep fillet welding compared.

used in many applications instead of continuous welds. Often, it is possible to use up to two-thirds less weld metal and still obtain the strength required, as for example in attaching stiffeners to bulkheads and plates of all kinds. The use of intermittent welds also distributes the heat more widely throughout the structure.

(f) *Use "backstep" welding method.*

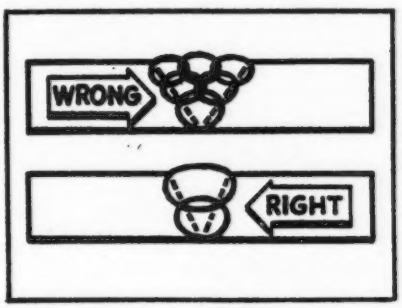
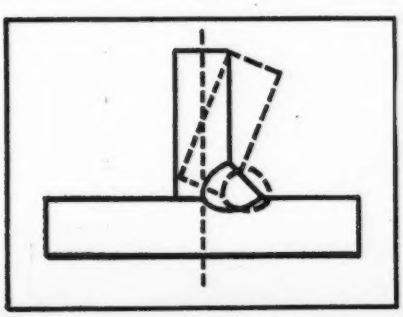


FIG. 11—Fewer passes of large beads are preferred to a larger number of small ones.

If the job requires a continuous weld, it still is possible to reduce the effective shrinkage force by the backstep technique. With this technique, the general direction of welding progression is, say from left to right, but each bead is deposited from right to left, Fig. 13.

As each bead is applied, the heat from the weld along the edges

FIG. 12—The leverage of contracting metal is reduced by the deep fillet technique.



causes expansion there which temporarily separates the plates at end *B*, but as the heat moves out across the plate to *C*, the expansion along the outer edges *CD* brings the plate back together. This occurs when the first head is laid. The same will be true as each successive bead is laid; the plates expand to a less and less degree with each bead because of the locking effect of each weld.

Where a continuous bead is laid in one direction, in many jobs there is a tendency for the plates to spread and become locked in the spread position as the welding progresses. However, welding speed is the determining factor here. As a general rule, the greater the speed, the more the amount of spreading. In some cases a speed can be found at which the plates will not separate at all, and a slow speed may close the plates. This action is independent of current values for a given joint, being solely a function of the speed of travel of the arc.

Rule II. MAKE SHRINKAGE FORCES WORK TO MINIMIZE DISTORTION.

(a) *Locate parts out of position.* A simple way to use the shrinkage force of weld metal to advantage is to obtain proper location of parts before welding. Fig. 14 shows in exaggerated form a T-weld being made with the vertical plates out of alinement before the weld is deposited. When the weld shrinks it will pull the vertical plate to its correct 90 deg. position.

(b) *Space parts to allow for shrinkage.* Another method is to space parts before welding. Experience indicates just how much space should be allowed for any given job so that the parts will be in correct alinement after welding is completed. An example is the trunnion arms of a large searchlight as shown in Fig. 15. The distance between the two arms has to be accurately controlled. Correct spacing of the parts prior to welding allows the arms to be pulled into the correct position by the shrinkage forces of the welding.

(c) *Prebending of parts.* Shrinkage force can be put to work in many cases by prebending or prespringing the parts to be welded. For example, when the plates in Fig. 16 are sprung away from the weld side, the counter force exerted by the clamps overcomes most of the shrinkage tendency of the weld metal, causing it to yield. But when the clamps are removed, there still is a slight tendency for the weld to contract, and this contraction or shrinkage force pulls the plates into alinement.

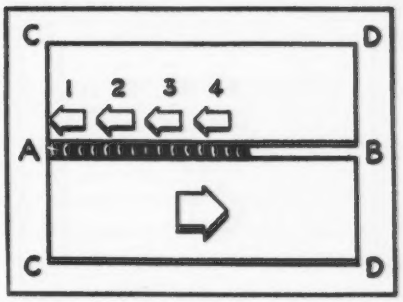


FIG. 13—"Backstep" method of welding reduces shrinkage forces

Rule III. BALANCE SHRINKAGE FORCES WITH OTHER FORCES.

Often the structural nature of parts to be welded is such as to provide sufficient rigid balancing forces to offset welding shrinkage forces. This is particularly true in heavy sections where there is inherent rigidity because of the arrangement

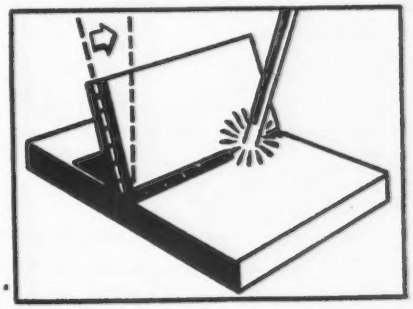
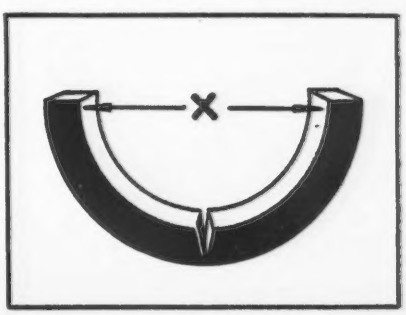


FIG. 14—Distortion may be anticipated by deliberate misalinement of plates.

of the parts. If, however, these natural balancing forces are not present, it is necessary to balance the shrinkage forces in the weld metal in order to prevent distortion.

(a) *Balance one shrinkage force with another.* This can be accomplished by the use of proper welding sequence which places weld metal at different points about the structure so that as one section of weld metal shrinks, it will counteract the shrink-

FIG. 15—Trunnion arms spaced to allow for shrinkage in the weld zone.



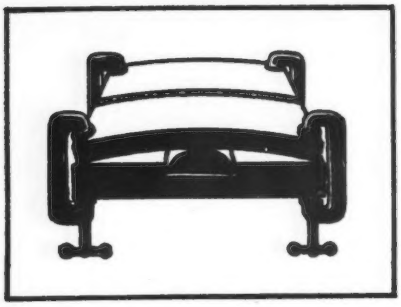


FIG. 16—Prebending of plates to counteract distortion.

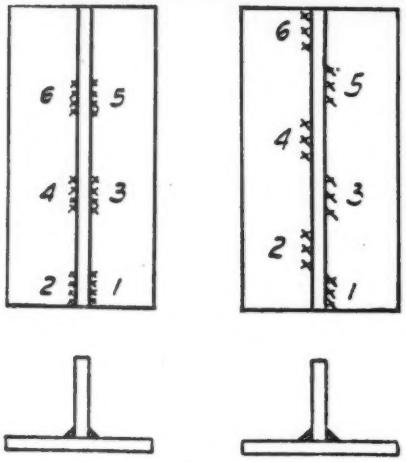


FIG. 17—Counteracting shrinkage forces by alternately welding on each side of a plate.

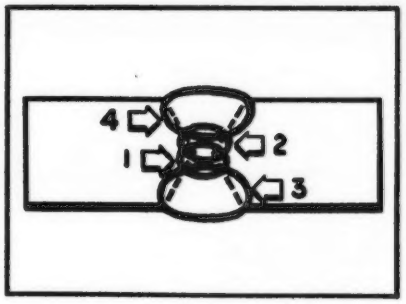


FIG. 18—Two ways of staggering intermittent welds so as to balance shrinkage forces.

age forces of previous welds already made. A simple example of this is the welding alternately on both sides of the neutral axis in making a simple butt weld, Fig. 17.

Another application of this principle is the staggering of intermittent welds applied in a sequence such as shown in Fig. 18. Here the shrinkage force of weld No. 1 is balanced by that of weld No. 2; the shrinkage force of weld No. 2 is balanced by that of weld No. 3, and so on.

(b) *Peening.* By peening the bead, it actually is stretched, counteracting its tendency to contract and shrink as it cools. Peening should be used with great care, for too much peening may damage the weld metal.

(c) *Use jigs and fixtures.* The most important method of avoiding distortion, and one in which Rule No. III is applied to the fullest extent, is the use of clamps, jigs or fixtures to hold the work in a rigid position during the welding. In this way, the shrinkage forces of the weld are balanced with sufficient counterforces to prevent distortion. What actually happens is that the balancing forces of the jig or fixture cause the weld metal itself to stretch, thus preventing the distortion.

It may be argued that this explanation and these suggestions are over-simplified. Yet, the reduction of a large amount of complicated data and varied theories to a few simple descriptions can be of considerable practical assistance to the welding personnel of any steel fabricator.

The material contained in this article forms the basis for a new sound color motion picture soon to be released by the Lincoln Electric Co. and produced in animation by Walt Disney Productions.

Multiple-Tooling on Engine Lathes

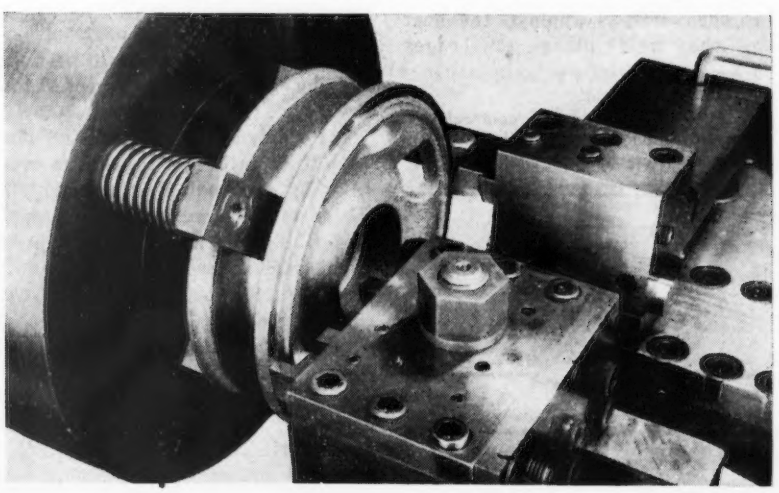
STANDARD engine lathes were recently adapted by the apprentice division for a finishing operation on small generator mounting flanges at General Electric's Lynn River Works when precision boring and turning machines or automatic lathes normally employed were unavailable. The operations involved facing the bolt flange and hub, and finish turning the rabbet, with a tolerance of +0.000, −0.002 in.

The rabbet diameter sizing cut was considerably simplified by mounting the carbide turning tool in an inverted position in a bridge-type tool block with a pivoting arrangement for tool adjustment. The holder is attached directly to the carriage of the machine at the rear and is not affected by movement of the cross slide.

For the three facing cuts, gang tools are set in a tool block on the compound. They are controlled in one direction by adjustable stops clamped to the cross ways of the carriage, and in the other direction by a gage block and a standard micrometer stop on the main ways. The carriage is located axially against the gage block when facing the flange and roughing the rabbet. The last few thousandths of movement, which rough the diameter of the rabbet, are taken by hand.

When facing the hub and sizing the rabbet, the cross slide is located against the outer stop on the cross ways. The carriage is fed longitudinally until it contacts the micrometer stop, without the gage block in between. This movement obtains a finished diameter on rabbet from the fixed tool attached to the bridge holder. It also sizes the end of the rim adjacent to the rabbet and the end of the hub, by plunge cutting action of two tools held in the tool block on the compound.

LATHE setup for facing and turning large rabbet on generator mounting flange.



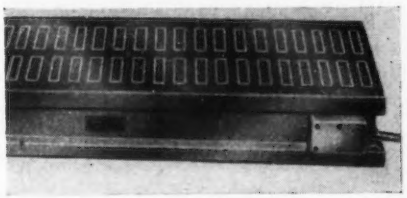
New Equipment . . .

Small Tools and Gages

. . . Recent developments in end mills, drills, fastening devices, fixtures and measuring instruments are described in the following pages.

Electro-Magnetic Chuck

AN electromagnetic chuck featuring a patent "Hermeti-Coil" which is waterproof and shockproof has been announced by *Hanchett Mfg. Co.*, Big Rapids, Mich. The coils are sealed in airtight plastic cases. The faceplate of the chuck is attached separately and can be replaced when it becomes worn. The chucks are espe-



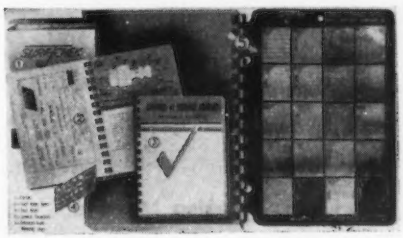
cially designed to withstand high external pressures, especially where coolants, water or oil are used. Chucks are made from low carbon steel for greatest possible magnetic holding power and are made in various sizes and styles, including rotary, rectangular and revolving types.

Air-Operated Holding Fixtures

AIR-OPERATED holding fixtures have been announced by *K & H Corp.*, Fort Wayne, Ind. The entire assembly consists of a double action air cylinder, a plunger which is made hollow to permit effective disposal of chips, a pawl and indexing mechanism and a cam and seat mounted on a suitable frame. A coolant pump supplies a flow of clean cutting oil to the tap and sleeves as an effective means of removing the chips. Successful operation on 35 to 40 lb. pressure is obtained by the use of a 3:1 ratio cam operated by an air cylinder having a 4.9:1 power increase over regular factory air line pressure. The index mechanism is operated by the return stroke of the double action cylinder.

Surface Roughness Gage

A KIT containing a 65-page instruction booklet bound to a gage consisting of 20 replicas of machined surfaces prepared by turning, grinding, milling, honing, lapping and polishing which vary in roughness from 500 to 5 microinches has been announced by Surface Checking Gage Co., Hollywood 28, Cal. The replicas are molded into a 5 x 7 in. plastic plate through the use of die inserts. The Surf-Chek method of designation is said to eliminate guess interpretation, to convey the engineer's specific instructions to the machinist and to facilitate the making of rapid and efficient roughness comparisons without the need of any special instruments. The system was developed by J. A. Broadson at North American Aviation, Inc., and was described in a series of articles on "Measuring



and Designating Surface Finish" which appeared in the Oct. 19, Oct. 26 and Nov. 2, 1944, issues of THE IRON AGE.

Granite Surface Plate

ACCURACY to 0.0001 in. when gaging points, laying out drill jigs, dies and fixtures is a feature of the granite surface plate announced by *Ideal Commutator Dresser Co.*, 1925 Park Avenue, Sycamore, Ill. The plate is ground and lapped to precise tolerances, has a low coefficient of friction and is non-magnetic. The plates are available in sizes varying from 8 x 10 in. to 30 x 72 in.

Pneumatic Die Grinder

A 25,000-R.P.M. pneumatic die grinder for continuous high speed operation has been added to its line by *Keller Tool Co.*, Grand Haven, Mich. The grinder has a one-piece housing of aluminum alloy with lead, muffler and throttle lever blending with the general housing contour. Special construction features include

a built-in oil reservoir which holds oil for 8 hr. operation. Oil is metered to the grinder through an automatic feeder device incorporated in the tool. Cool exhaust air circulates around the finned surface of the cylinder permitting continued operation at high speed without overheating. Three models are available, Model No. 1505A, equipped with collet chuck for holding mounted grinding wheel with ¼ in. diameter shanks, Model 1505B, equipped with adapter for holding unmounted grinding wheels with ¼ in. diameter holes and Model No. 1505 C, equipped with ¼ in. capacity Jacobs chuck, designed especially for small, light drilling at high speeds.

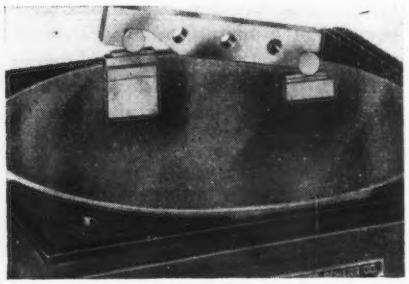
Reamer Holder

A PRECISION centering reamer holder for hand or automatic screw machines and turret lathes has been announced by *Lavallee & Ide, Inc.*, Grape Street, Chicopee, Mass. The holder is set with an indicator, establishing a true center line which compensates for errors in chucks, turrets and even diagonal errors due to worn turret locks. Once the true center has been established, reamers may be interchanged freely in any size within the capacity of the holder

without the use of bushings or adapters. The reamer drives from a dead center on the true axis of the machine which is said to eliminate bell mouthing. Stub reamer and chucking reamer heads 1/16 to 7/16 in. capacity and a chucking reamer head of 7/16 to 1⅛ in. capacity are available.

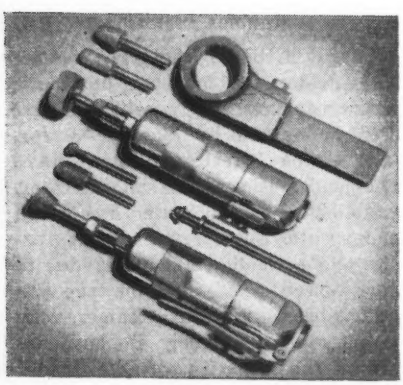
Sine Bars

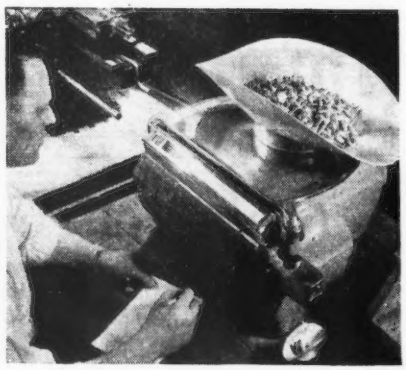
THE addition of four models of sine bars to its line of precision measuring equipment has been announced by *George Scherr Co.*, 200 Lafayette Street, New York 12. The sine bars come in the following sizes: 1 x ⅝ x 5 in. and 1 x 1¼ x 5 in. Both models are available in ground and lapped surfaces. The bars are normalized by both heat treating and by being subjected to freezing at a temperature below minus 100 deg. F.



Rotary File and Die Grinder

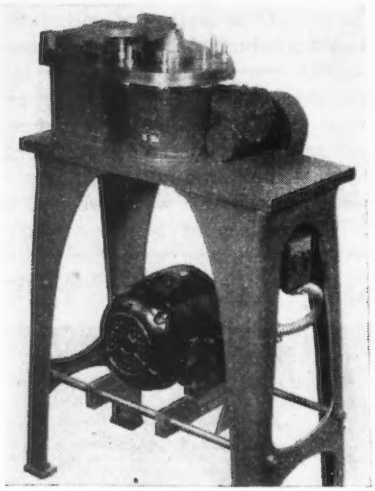
AIR-OPERATED models 1007 and 1008 rotary file and die grinders have been announced by *Forss Pneumatic Tool Co.*, Rockford, Ill. As rotary files, they are especially suitable for cleaning aluminum castings and for metal pattern work. Features of the tool include a safety lock for the trigger, a flexible sleeve collet chuck, integral cooling system for bearings and case, durable poppet valve throttle, rotor end plates integral with the rotor and air exhaust forward around the spindle. The tool has a speed of 25,000 r.p.m.; length of 6½ in.; diameter of 1½ in.; weight of 1 lb.; elastic wheel capacity of 1½ in. and a vitrefied wheel of 1 in.





Counting Scale

WHAT is said to be the first scale to count parts by direct reading has been announced by *J. H. Keeney & Co., Inc.*, 6610 South Ashland Avenue, Chicago. Instead of counting a bin full of parts one at a time, or by ratio methods, the parts are placed on a counting scale and reading for the number of parts is registered on the scale. A suggested use for the scale is in solving inventory problems resulting from contract terminations.



Rotary Marking Machine

A ROTARY marking machine for marking steel spark plugs has been announced by *Wm. A. Force & Co.*, 216 Nichols Avenue, Brooklyn. In marking, the piece moves past the stationary marking die revolving on its own axis. A special mandrel support to prevent deflection of the work is provided. Each of the eight individual mandrels are separately adjustable for position by use of eccentric bushings.

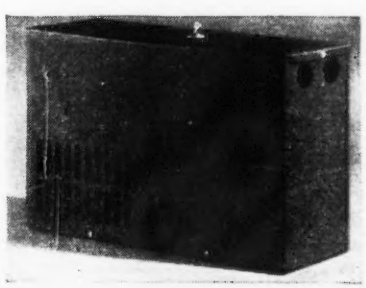
Ball Bearing Plug Gages

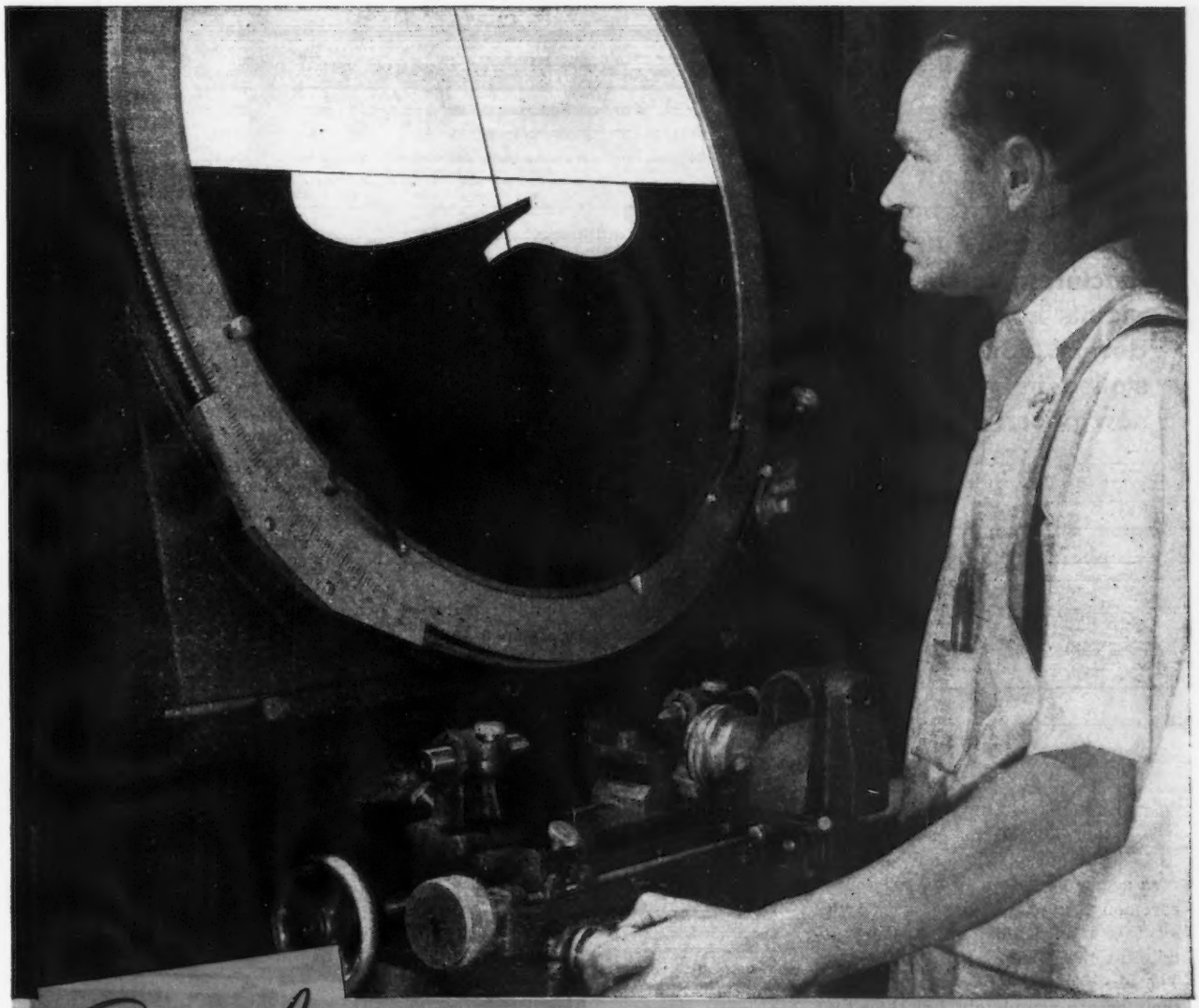
DEVELOPED originally by Kemworthy, London toolmakers, to expedite inspection of work in the British war effort, Emmerton ball bearing pilot plug gages are now being marketed in this country by *Taft-Peirce Mfg. Co.*, Woonsocket, R. I. This plug gage is distinguished by a pilot ring of hardened steel balls in an annular retainer which encircles the front end of the gaging surface. Since the balls are free to rotate in any direction, they automatically guide gage and work into positive alinement regardless of the angle at which the gage approaches the work. The gages enter the work on their own weight and do not jam either in

entering or withdrawing even though the gage diameter is exactly that of the hole, it is claimed. They are available in any size desired from ¼ in. up.

Electronic Rectifiers

ELECTRONIC rectifiers for magnetic chucks, designed to convert 110 volt a.c. to 110 volt d.c. have been announced by *Davis & Murphy*, 5252 Broadway, Chicago 40. They embody full-wave rectification by electronic tubes mounted on shock proof bases, precision built transformers, condensers and easily replaced protection fuse. EPCO No. 2 delivers 2 amp. (approximately 250 watt) at 110 volt d.c. and EPCO No. 6, 6 amp. (approximately 700 watt) at 110 volt d.c. Two of the No. 6 units can be used where requirements call for 12 amp. output; three can be used for 18 amp. output, etc.





How else

WOULD YOU, OR COULD YOU, INSPECT SUCH PARTS ACCURATELY AND RAPIDLY

The tolerance on the profile of this form ground die section is plus or minus .0005". *Inspection is simple*—the profile is projected at 62½ magnifications upon the 30 inch screen of the Jones & Lamson Optical Comparator and compared with the accurately scribed master outline.

The Jones & Lamson Pedestal Optical Comparator is an essential to the modern tool room. When equipped with all measuring attachments, lateral or vertical dimensions can be measured to within .0001 of an inch, and angles can be measured to within 5 minutes of arc—*accurately and rapidly!*

This book "Beyond a Shadow of a Doubt" will tell you more about our Optical Comparators and what they are doing.

Photograph courtesy of Star Machine & Tool Company, Cleveland, Ohio

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Assembly Line . . .

STANLEY H. BRAMS

• Breakaway by WPB from historical basis of apportioning auto manufacturing brings complaints from large producers... Supplier firms stalled in effort to get new prices.

DETROIT — Automobile production allocations, awaited with the anticipation and hopefulness accompanying a baby christening ceremony, appeared last week with all the unexpected and startling attributes of a good hearty Bronx cheer. The big producers haven't yet caught their breath completely, but their first pantings give the rather definite impression that they are none too happy about the way the War Production Board decided to do things. But any forthcoming expressions of irritation from that part of the automotive receiving line are being drowned out by the unexpurgated delight from the small producer section of the industry.

In brief, WPB started by taking the historical averages of 1941, deducting 4 per cent from the totals of General Motors, Ford and Chrysler, and prorating that amount among the small producers. These figures were then halved, in order to develop equitable individual producer amounts which would aggregate 2,146,786 vehicles, about half a normal year's output. Of these, 10 per cent would be built during the balance of this year. So far, so good.

Then, however, steel statisticians in WPB decided their original anticipations of an availability of 500,000 tons of steel for civilian use—largely automotive—during the balance of this year was on the truly conservative side. The quantity, they figured, would run to a million tons; and by the time the allocations as they finally appeared had been put together the anticipation figure had stretched to 1,500,000 tons.

As a result, WPB decided to expand this year's allocation total to 241,916, up about 25,000 from the originally planned level, and to enlarge authorizations for the first 1946 quarter to 449,102, up another 55,000 or so above first planning.

Looking over the 80,000 additional vehicle authorizations, WPB decided to distribute its largesse mainly in the direction of the smaller producers. All of them were given a minimum quota of 8000 cars for the balance of this year.

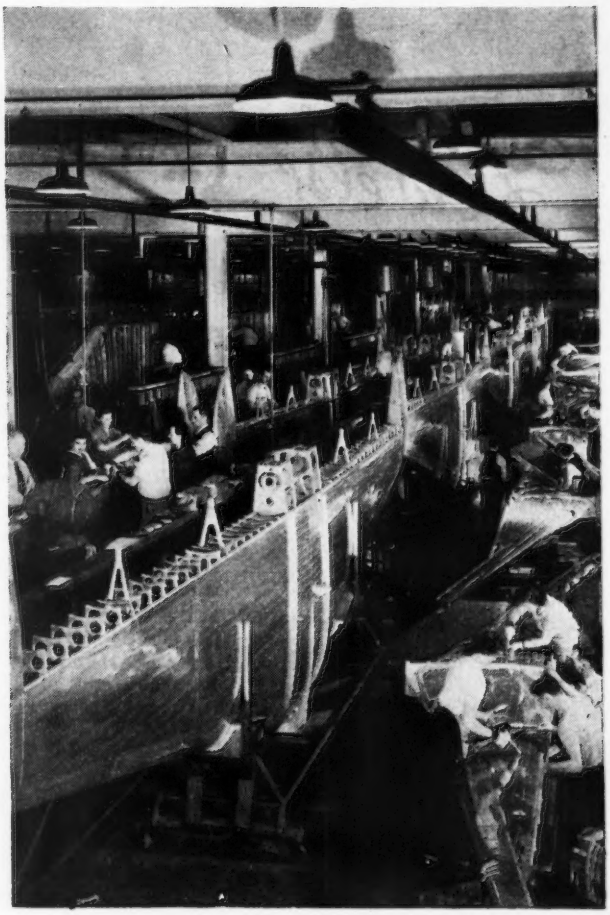
SO it is that Crosley, which built around 2000 cars in a couple of very vague years as an auto maker, can build 8000 units from July to January. So can Graham-Paige, which stopped being a factor in the automobile business five years before the war, even though it built a trickle of cars up to 1941.

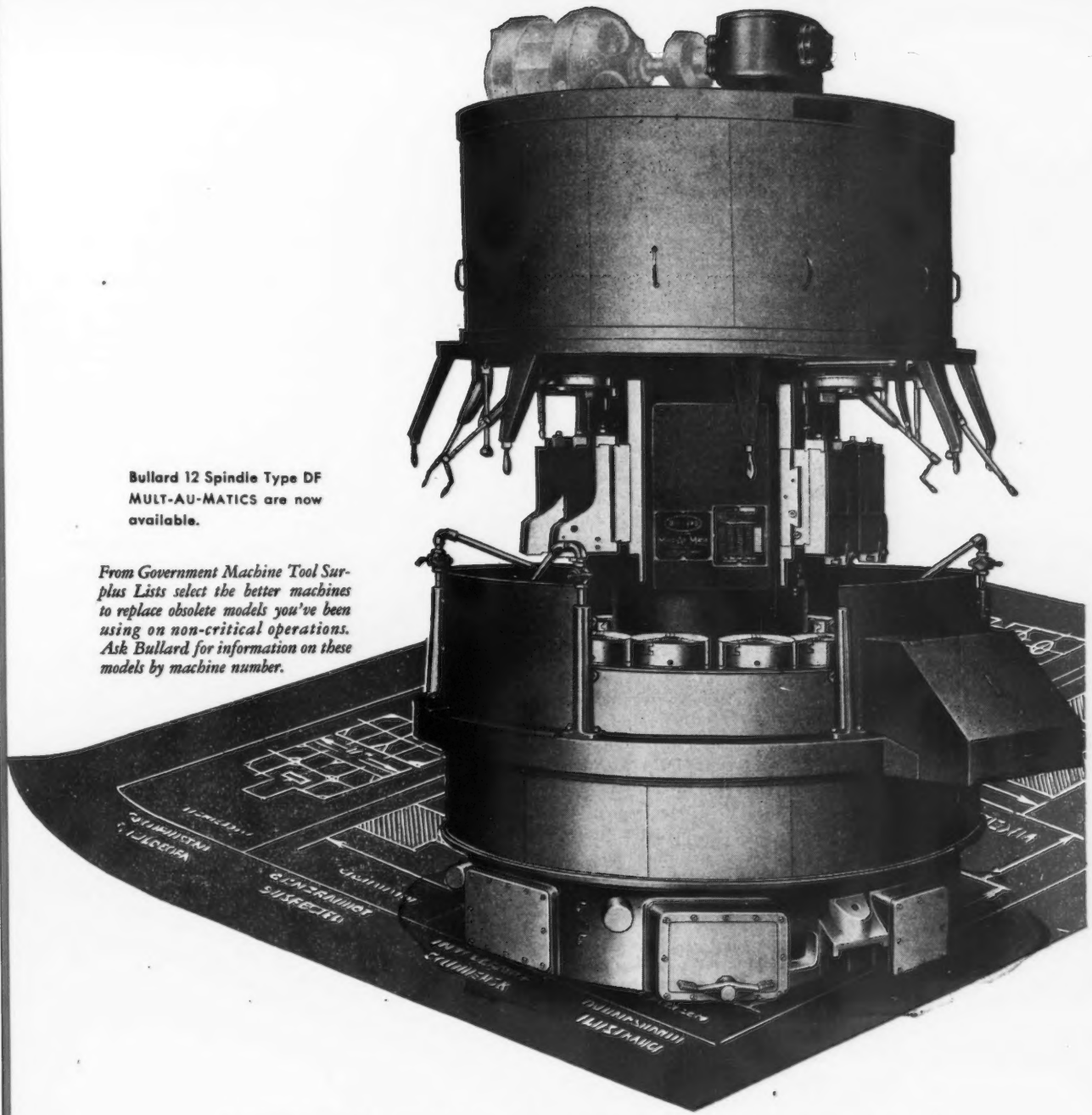
The first public protest over the situation, and perhaps the only one which will be made outside the closed WPB conference doors where GM, Chrysler and Ford joined in complaint when they learned what was afoot last week, came from J. R. Davis, sales director of Ford. Davis voiced the viewpoint of the Big Three when he said Ford does not understand "why each company is not given its rightful share of the available materials based on prewar experience, instead of which several of the independents are permitted to operate at a level nearly as high or much higher than prewar schedules." Ford people, without a doubt, feel they have a membership claim en bloc to that in-

o o o

VOLUME OUTPUT: *Production of huge stabilizers for B-29 Superfortresses is being undertaken on assembly lines at the Conner Avenue plant of Briggs Mfg. Co. in Detroit.*

o o o





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From Government Machine Tool Surplus Lists select the better machines to replace obsolete models you've been using on non-critical operations. Ask Bullard for information on these models by machine number.

BULLARD MULT-AU-MATIC . . . TYPE DF

Twin Tooling Doubles Production With Investment Up Only Slightly

On work up to 8" in diameter and 10½" in height, you can now produce two finished pieces in the time of the longest single boring, turning, facing, threading, grooving or drilling operation plus a few seconds for indexing.

Twin spindles at each of the six or eight stations and twin tooling on the head of each working station mean that you double the ordinary MULT-AU-MATIC production output for its size of work.

That's lowering unit production costs in earnest . . . a *must* if free enterprise is to increase buying power and preserve full employment.

For full details about Bullard Twin 6 and Twin 8 Type DF MULT-AU-MATICS, write today for Bulletin DF1.

The Bullard Company, Bridgeport 2, Connecticut.

BULLARD

CREATES *NEW METHODS*
TO MAKE MACHINES DO MORE

teresting and novel organization recently expanding in Detroit, known only as the C.A.I.C. Club.

Obviously on the allocation basis Ford and General Motors are at a bit of a disadvantage alongside the others. Chrysler is peculiarly fortunate, in that all its dealerships for Dodge, Chrysler and DeSoto are dualed with Plymouth, which has the effect of doubling cars per outlet.

The allocations per company, except for the boosts given the smaller producers, follow pretty well the anticipations laid down here on May 31, 1945, p. 64. They follow, Column I being the quota for the last half of this year, Column II being the quota for the first 1946 quarter.

AUTOMOBILE ALLOCATIONS

	Col. I	Col. II
General Motors	95,095	190,192
Chrysler	49,635	99,270
Ford	39,910	79,820
Studebaker	9,275	18,550
Hudson	8,000	13,602
Packard	8,000	12,118
Nash-Kelvinator	8,000	11,550
Willys-Overland	8,000	8,000
Graham-Paige	8,000	8,000
Crosley	8,000	8,000

As yet the tonnage of steel estimated as military surplus this year and earmarked for automotive and other civilian production has not materialized a bit. Cutbacks at producer levels, Detroit and elsewhere, are not permeating down to the mills. To meet this contingency, WPB has instituted what it calls Program 48, consisting of a letter to all industrial plants urging them to turn in their steel tickets at once when they get a cutback, plus a personal call from a WPB representative when a cutback occurs, to check up on the steel cancellation situation. What the agency hopes to forestall in that manner is the erstwhile contractor's letting steel come to his plant on allocation, then reporting it as surplus and buying it for his own use, right out of his own yard. Naturally the contractors wouldn't want to buy or use for civilian goods all the specifications and shapes of steel they get for war materiel, but apparently enough can be put to peacetime uses to clog up the cancellation flow to the mills. Or so WPB thinks, and it is moving energetically to make the actual surplus tonnage come closer to the totals figured out on paper.

Abandoning the production and steel problems of the automobile makers for a bit, consider next the worries of the auto parts makers, another integral group of C.A.I.C.'ers. (One supplier, incidentally, has membership buttons). They can't find out what OPA will permit them to charge for their products.

A meeting in early June between the industry and OPA was followed by another last week, with tangible results achieved thus far only slightly on the fruitful side of dead center. The session last week ended with the government agency's decision to withhold action until it talked about the problem with the auto makers. The parts people pointed out that the auto makers were in no position to discuss prices unless they know what their parts would cost, but that was the way the matter ended.

As a matter of fact, before OPA can set up a formula for the parts prices, it must go farther back and set up policy on castings, forgings and screw machine products. The forge people are muttering darkly that unless they get some relief they will go on a producers' strike. OPA has promised to go into this matter quickly, and on the face of it prompt action is urgently needed to start off the chain of cost relationships which go all the way from the drop hammer shops to the final assembly lines.

RECIPROCAL AID: *Gas tanks and flame dampers pile up in this air depot somewhere in England, waiting to be fitted to American aircraft of the U. S. Air Corps in the European theater. The equipment and manpower involved is a part of British reverse lend-lease.*

Midwest Machine Tool Books in Good Shape

Rockford, Ill.

• • • **Most machine tool** order boards are in good shape here despite extremely heavy cancellations in the past 80 days.

Several important producers currently hold larger backlogs than at the same time last year and have hopes of maintaining the relationship throughout 1945. Heavy military and foreign cancellations in recent weeks have greatly changed the distribution of orders, however. Domestic civilian business now constitutes more than 50 per cent of the outstanding order total in most cases, with heavy commitments from the automotive industry.

Despite a sharp reduction in orders destined for Russia, both through shipment and cancellation, foreign business is by no means disappointing. French orders are very much in evidence, and some business has been placed by Indian purchasers recently.

The heavy automotive volume is reflected in existing models, with few new equipment items or special production lines which characterized model changes in past years.

Progress has been made in securing sufficient manpower to meet production schedules, with some firms laying off less efficient workers. Difficulty still is experienced in material procurement, particularly castings, and some types of fractional horsepower motors.

"Taps that Fill the Gaps" . . . AND KEEP PRODUCTION ROLLING!

Stick to your War Job!

The work you personally are doing may help to shorten the War and save lives. Our fighting men are depending on you.

Don't let them down!

Size of Thread being tapped, 1-31/32" — 16 NS; length of Thread, 1¼". Number of pieces per hour off drill press — 40. Number of pieces per hour in hand operation for hand sizing—20. Photographs permitted by courtesy of Miller Mfg. Co., Detroit.

MURCHEY

SOLID ADJUSTABLE TAPS

TYPE "E" FOUR CHASERS • TYPE "R" SIX CHASERS

Sometimes a machine does not permit the use of a collapsible tap. Sometimes space is too limited. Sometimes sizing operations are required. When such circumstances arise, MURCHEY SOLID ADJUSTABLE TAPS solve the problem. Although not equipped with collapsing devices, they nevertheless have all the other advantages of a collapsible tap. They fill the gap between collapsible and solid taps. *Being adjustable,* correct decimal size is always maintained. Inserted chasers are readily removed for resharpening. Once you purchase the tap body, you can obtain a wide variety of thread sizes merely by purchasing other chasers. The chasers, which are less expensive than solid taps, may be replaced when necessary. Write for complete descriptive literature.

MURCHEY MACHINE & TOOL CO.

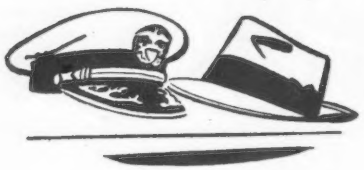
Detroit 26, Michigan

Murchey manufactures all types of Collapsible Taps, Self Opening Die Heads, Thread Milling Machines and Shell Tapping Machines. Write for catalogs. Address Dept. I.

MURCHEY

Washington . . . L. W. MOFFETT

• SPB issues new regulation controlling disposal of contractor inventories . . . Sets firm pricing policy for reconversion guide to peacetime output.



WASHINGTON — Superseding the statement of policies in the sale of contract termination Inventories of the former Surplus Property Administration, a new regulation controlling disposal of contractor inventories has been issued by SPB. It sets a firm pricing policy to guide the clearance of war plants for quick reconversion to peacetime production and is designed to guard against excess profits as well as against windfalls to contractors and buyers alike.

It also defines scrap, salvage and waste, and with experience after World War I in mind the regulation provides controls of surplus property as unserviceable. The regulation does not cover sales of plant equipment such as machine tools. Such equipment is covered by a previous SPB regulation. Also goods to be sold or retained for continued war production are excluded from the new regulation as is property involved in noncost settlement of contracts.

The new rules apply only to surplus property in the United States, territories and possessions. They affect pretermination negotiations from July 1 but are otherwise effective on Aug. 1. All sales and retention of surpluses are subject to WPB and OPA regulations. The pricing policy is so fashioned as to prevent excessive profits to contractors who keep surplus goods as part of pretermination agreements, which, looking to speedy reconversion, fix the contractor's final claims against the government before his contract is ended. Generally, it is provided that sale prices will be either at market levels or at fair and reasonable prices, but not less than 50 per cent of cost. Sub-contractors are given the same rights and privileges as prime contractors to keep or sell surpluses in their inventories.

Another main objective of the new rules is to avoid undue speculative profits through the resale of goods retained by the contractor as part of the settlement, or sold in the closing transaction. This objective, as the board pointed out, automatically includes the aims of getting a reasonable return for the government and of protecting the country against demoralized markets. Toward these ends, emphasis is placed upon getting inventory surpluses into use in peacetime manufacture and not for resale. Taking steps to set up a continuing survey of goods in short supply, the board said that if at any time it appears that scarce items for which there may be a wide demand are not being distributed equitably, action will be taken to protect small business from the danger of a few big contractors buying them all up. The foil against windfalls requires contractors who retain property to pay the full price that could be obtained if the property were sold. It is also provided that property retained by contractors should be for use and not for resale or profit, the purpose being to "assure the most effective use" of surpluses.

The tightened regulation regarding scrap provides that all unserviceable property is to be sold on the open competitive market. Where property costing more than $25,000 is involved, a reviewing authority must approve before it may be declared unserviceable. For this purpose, the RFC has set up a system of field consultants whose services will be available to the owning agencies.

In exceptional cases, when the transition from war to peacetime production would be delayed by strict observance of the regulation, negotiated sales of unserviceable property is permitted so as to prevent unemployment. But the buyer must certify that the goods will be used or sold only as scrap.

All serviceable property to be sold or retained for resale by the contractor that costs more than $10,000 must be advertised for sale in reasonably sized lots to establish a market price and the price cannot be less than 50 per cent of cost. Small lots costing not more than $300 may be retained or sold at the best obtainable price. Sale under these conditions also is permitted in cases of small inventories when the total termination claim against the government is less than $10,000 including disposal credits, or not more than $1000 excluding disposal credits.

Any property which the contractor does not take over from his inventory must be declared surplus unless the owning agency needs it for further war production. However, because the cost of handling small lots generally is greater than may be recovered from a sale, goods costing not more than $300 may be sold by the owning agencies. They also will continue to sell scrap, waste and salvage without declaring them surplus.

* * *

A good glimpse of what is being done with huge tonnages of steel that have been converted into munitions may be seen at U. S. Army ammunition depots in Europe. There is, for instance, Ordnance Depot O-610, one of the largest in Europe, sprawling over 350 sq. miles of Belgium southwest of Liege. VE-Day found officers and men at this depot preparing 100,000 tons of munitions for shipment to United States armies in Germany. Now they have begun the gigantic task of collecting and preparing several hundred thousands tons of ammunition for shipment to the Pacific theater. Up to VE-Day, nearly 700,000 tons of artillery shells, small arms ammunition, rockets, grenades, dynamite, mines and bangalore torpedoes had been dispatched without interruption to the front lines, despite German bombers and V-bombs.

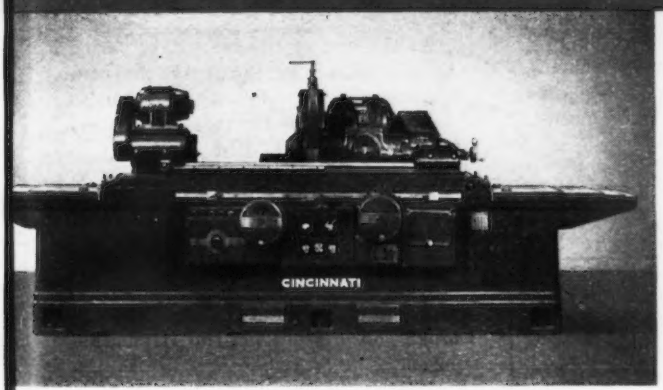
Not only has the depot begun to receive ammunition turned back for divisional ammunition points, but thousands of damaged shells have been sent back. These shells are repaired, repacked and prepared for shipment to

CINCINNATI 12"x36" Hydraulic Universal Grinder. The Hydraulic Universals are available in 12", 14", 16" and 18" sizes. Catalog G-456-1 contains specifications for the 12" Grinder, and Catalog G-471-1 for the 14", 16" and 18" sizes.

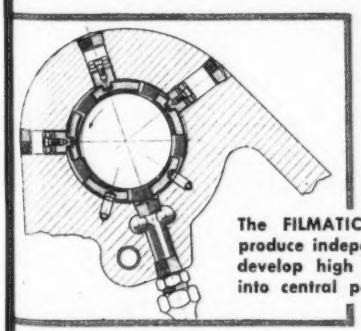
Sweet's Catalog File gives a brief description of all CINCINNATI Grinding and Lapping Machines.

FILMATIC

The bearing with a FUTURE!



CINCINNATI 10" Plain Hydraulic Grinding Machine. Catalog G-490-1 contains complete information and specifications. The Plain Hydraulics are available in 4", 6" and 10" sizes; the Light Types in 10" and 14" sizes.



The FILMATIC principle. Self-adjusting shoes produce independent, converging oil films which develop high radial pressures, forcing spindle into central position.

Here's a pertinent question to ask your maintenance men and shop supervisors: How long do the grinding wheel spindle bearings last in your precision grinders? They might say, "Well, that all depends upon the finish and accuracy I want, and how hard I 'push' the machine to grind heavy stock removal jobs." If you have CINCINNATI's with FILMATIC Spindle Bearings in your shop, then their answer would be, "I don't know how long the bearings will last, for they have never given me any trouble." ¶ That's the FILMATIC record everywhere, for they have been giving trouble-free service on CINCINNATI Grinders as long as eight years. They are bearings with an enviable past, and a bright future, for FILMATICS just never quit regardless of what they're called upon to do. All CINCINNATI Grinders are now equipped with FILMATIC Bearings, and you have a wide choice of these efficient and productive machines.

Centertypes—4", 6" and 10" Plain Hydraulic, 10" and 14" Light Type Plain Hydraulic, 14", 16", 20", 24" and 28" Plain Self-Contained; 12", 14", 16" and 18" Hydraulic Universals.

Centerless—Nos. 2, 3 and 4, and Centerless Lapping Machines.

You can't afford to overlook the advantages of CINCINNATI Grinding Machines with FILMATIC Spindle Bearings. The complete story of this unusual bearing may be found in booklet G-446. Write for your copy today.

CINCINNATI

CINCINNATI GRINDERS INCORPORATED

CINCINNATI, 9
OHIO, U.S.A.

CENTERTYPE GRINDING MACHINES . . . CENTERLESS GRINDING MACHINES . . . CENTERLESS LAPPING MACHINES

United States troops in the Far East by the 227th Ordnance Ammunition Renovation Co., operating in what was at one time a sugar beet factory. This means conservation of steel and its lethal product. It also cuts costs. Maj. George B. Russell, Hampton, Long Island, said the renovating company is called "our money-saving department." Figures show, he said, that it has saved $1,000,000 worth of shells a month. Men of the 227th also destroy ammunition which cannot be salvaged, blowing it up in huge pits located miles away from any dwellings.

* * *

The Smaller War Plants Corp. boondoggle is apparently drawing to a close. Some in the Department of Commerce have been selling Secretary Wallace on the idea of absorbing Maury Maverick's organization within the department and transferring the lending functions of SWPC to RFC. This would mean an expansion in RFC to include a special Small Business Section. The transfer could be effected by the President under the provisions of the First War Powers Act of Dec. 18, 1941. This act permits the President to utilize, coordinate, consolidate and transfer the functions of any executive agency.

Since President Truman has shown some indications of practicing economy as well as cutting down the administrative functions of government, it probably would not be hard to sell him this idea, provided a soft job can be found for Mr. Maverick.

CED's Research Group Recommends Removal Of Wartime Controls

Washington

• • • **The Research Committee** of the Committee for Economic Development on June 20 made recommendations to the House Committee on Post War Economic Policy and Planning for the ending of wartime controls.

Presented by Raymond Rubicam, a member of the Research Committee, former chairman of the national advertising agency of Young & Rubicam, Inc., the recommendations called for removal of controls from the present until six months after final victory by administrative action only, wherever the need for them no longer exists. During fighting each such suspension, the committee said, must be justified by cutbacks or surpluses which make facilities, materials and manpower available over full military needs.

As controls are interdependent, it was pointed out, their administrative suspension must be effectively coordinated. Piecemeal action by separate agencies subject to conflicting pressures, it was added, would not produce an orderly demobilization. Adequate powers, it was explained, have been given to the director of mobilization and reconversion to control such suspensions. Within six months after final victory, the Research Committee said, the director should review all controls and should, not later than six months, remove all remaining controls not clearly necessary beyond that date. A period of six months after final victory, it was declared, will permit substantial reconversion and will also coincide with the expiration of some of the President's emergency war powers.

Legislative authority, it was recommended, should be continued or extended beyond that date only for such wartime controls as may be plainly needed to hold inflation in check during the remainder of the transition period. The committee said that the legislative authority should not, however, be exercised except as determined by the director.

At the end of the transition period as determined by Congress, the concluding recommendation said, legislative authority for the last of the wartime controls should be ended.

"The recommended procedure would end, reduce, or modify most controls before or by six months after war's end," the committee commented. "Yet it would keep us prepared for prompt preventive action if economic fires broke out later in the transition period.

"National policy on the ending of controls should be clearly stated at the earliest possible time. The American people should be informed that such policy aims at the complete ending of all wartime controls within a limited period of time."

THE BULL OF THE WOODS — BY J. R. WILLIAMS

FEEDING A LOCAL EUROPE

Great Lakes Steel to Expand

Detroit

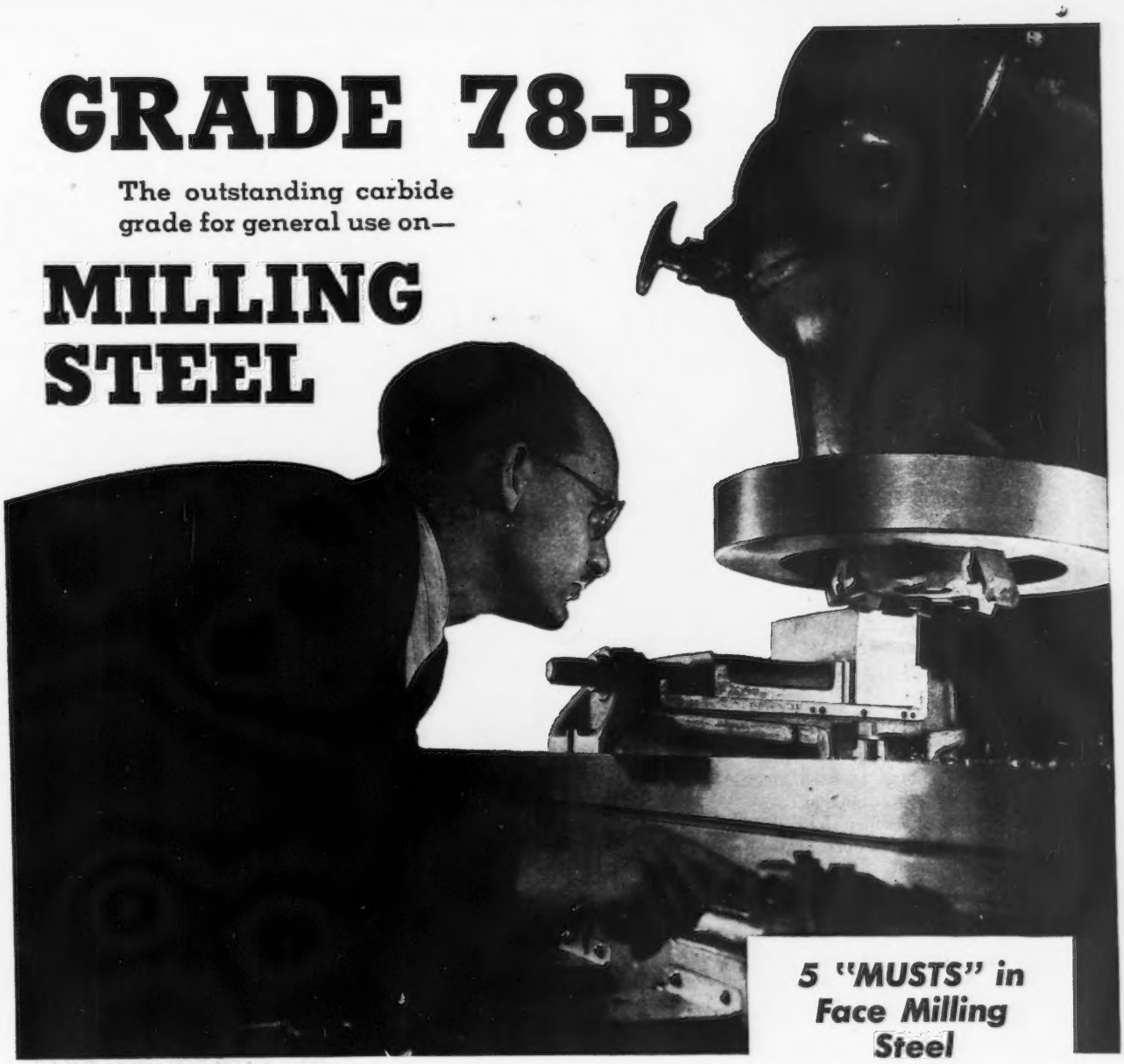
• • • **The Stran Steel Division** of Great Lakes Steel Co. has been granted by WPB a $1,250,000 expansion of its strip making facilities at Ecorse. The enlarged facilities will be employed to make joists, studs, girders, etc. A new building is expected to be built.

Great Lakes itself, meanwhile, has been authorized to build a $240,000 pickling plant at its Ecorse works.

GRADE 78-B

The outstanding carbide grade for general use on—

MILLING STEEL



5 "MUSTS" in Face Milling Steel

1. No. of teeth should not exceed No. of inches in cutter diameter. .
2. Grinding is vital. Use recommended method.
3. Use a flywheel.
4. Use negative rakes.
5. Position work in relation to cutter so cutting edge enters at negative angle.

Send for these technical manuals: GT-127 (Grinding), GT-174 (Application).

For general, all-around use on the milling of steel, you'll find Carboloy Grade 78-B outstanding in performance. Highly resistant to edge wear and cratering—and with the toughness to withstand severe cutting conditions, Grade 78-B takes all commonly used steels "in its stride". It plows through heavy cuts, or skims along on light finishing for prolonged periods of continuous use between sharpenings.

With cutters in your crib equipped with Grade 78-B, you're prepared to "tool-up" *immediately* with the right carbide grade for most current jobs—ready to "GO" on a wide range of steel milling applications.

Try Grade 78-B—the universal grade for steel milling—today!

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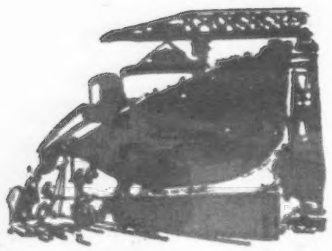
CEMENTED CARBIDES

West Coast.

OSGOOD MURDOCK

• Quick action urged on Pacific Coast interests if aluminum and magnesium are to be a permanent part of the picture . . . Meeting at Seattle seen as starting gun.



SEATTLE—Attempting to draw up workable plans to keep the new industry a war has left on their doorstep, businessmen and industrial leaders at the Western States Council Light Metals Conference learned last week they will have to act promptly if they are to make aluminum and magnesium production a permanent part of the Pacific Coast scene. They were warned repeatedly by technical experts that they will have to make moves within the next six months to take over Defense Plant Corp. properties or it may be too late.

Under normal conditions, the West Coast will have to buck marketing, transportation and intrenched interest in competing with other light metal firms in the country. However, unless the leaders of the Pacific Coast states can draw up plans to lay before Congress and start action with the DPC, they face the prospects of having to begin private enterprise by taking over idle plants in areas where labor has moved out.

At the end of a two-day session at the Seattle Chamber of Commerce, 250 delegates named a 15 man committee to continue the study and start taking the necessary steps. Everyone in attendance knew both the dark and the light side of the picture the Coast faces if it is to have a well integrated light metals industry owned by local capital.

Advantages the West has in light metals production are three-fold according to John D. Sullivan, Battelle Memorial Institute, Columbus, Ohio. 'The West's three prime assets are: Cheap power, high caliber labor, and a favorable climate," he said. "In contrast the West lacks sufficient population to become a large consumer and is in a disadvantageous position as regards freight rates and proximity to markets."

According to Dr. Nathaneal Engle, director, bureau of research, University of Washington, who has just completed an extensive survey on markets for western light metals, the Coast can because of its cheap power and high quality labor produce aluminum at a cost to compete with any company in the country for the larger markets surrounding the Great Lakes. Coastal plants will have to look to the Mid-west and northeastern part of the country for a selling place, he believes.

"While the Pacific Coast will have the ability to produce over 20 per cent of the postwar aluminum, it will have a market for only three per cent due to lack of population," Dr. Engle states. "The Mid-west will consume from 50 to 55 per cent of the total produced, and the Northeast will use from 30 to 35 per cent. Selling to the northeastern section would appear best for the Pacific Coast as they have no large plants at present and shipments could be made by water."

As for postwar markets, the Engle survey shows that 56 per cent of the country's total aluminum supply will be sold to the transportation industries. Another 24 per cent will be consumed by the iron and steel trade; six to eight per cent will go to the electrical trade, and a little over three per cent to making pots and pans. The machinery industry will use slightly over two per cent.

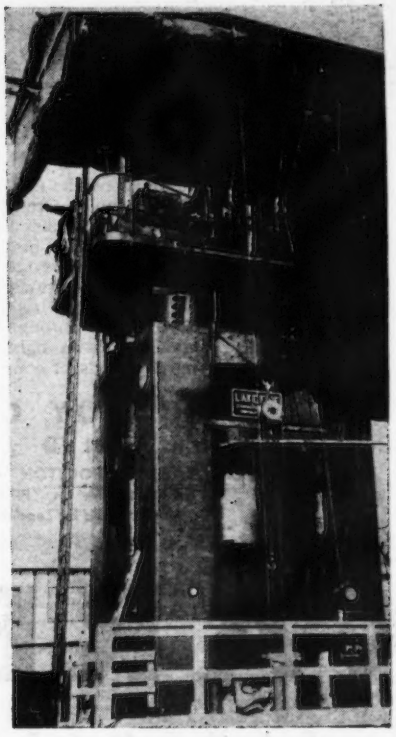
While the Pacific slope's great selling point, which brought DPC into the area, is cheap power, delegates showed a fear of the big Shipshaw Canada plant which was partially financed by this country. With its low costs of production the Shipshaw plant can compete favorably with any company in the world. There was a general feeling that this country must bring down its power rates to U. S. companies.

This attitude was summed up by Walter L. Rice, vice-president of the Reynolds Metals Co., who said, "If we are going to expand in the Pacific area we want to know what the government is going to do about giving us power rates to compete with Canada. We also want to know what the government is going to do about the dollar a ton tariff which American firms must pay on all bauxite they import."

Mr. Rice said he saw almost unending expansion possibilities for his company in the Pacific Northwest if the government would help out with low power rates. He believes the impetus for obtaining low power rates must come from the Pacific Northwest. "It's up to you," he said.

This wasn't the only fear expressed over foreign competition. U. S. Senator Warren G. Magnuson, who brought President Harry Truman's greetings to the conference down from Olympia, Wash., where the two were

CARTRIDGE CASES AL FRESCO: *Much too large to set up in its present buildings, this 6000 ton capacity Lake Erie hydraulic press was recently installed by the Norris Stamping & Mfg. Co. in a lot adjoining its Los Angeles plant. The machine weighs 500 tons and is supported on 30 ft. of piling. The height of the press is 32 ft. above ground level and extends 11 ft. below ground to the foundation. Installation was made in record time in order to get the press into service for heading cartridge cases used in the heavy ammunition program.*

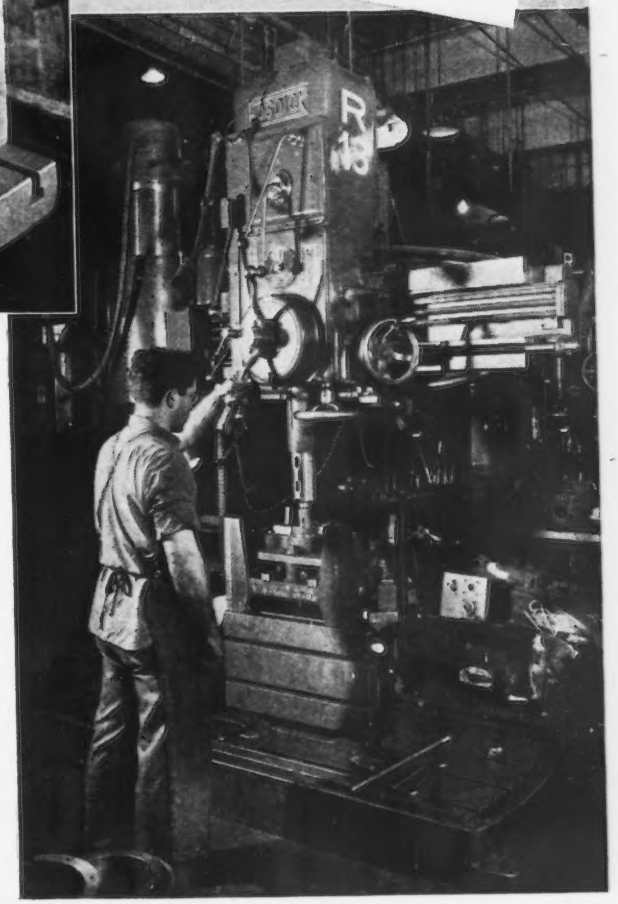


BORING AND COUNTERBORING

to limits of .0002 on a

FOSDICK RADIAL DRILL

ARMY E NAVY



● The rigidity of Fosdick Radial Drill construction is clearly indicated by the close tolerances maintained on this boring operation.

On the work illustrated four—2.834 inch holes are being bored and counterbored to limits of .0002 inch.

Various other operations are being performed including drilling and reaming several holes, counterboring others, and tapping a series of 1 3/8 inch holes on the same piece before removing work from the jig.

This is typical of the time and cost saving qualities and versatility of Fosdick Radials.

For complete information write for Fosdick Radial Drill Bulletin R. I.

FOSDICK MACHINE TOOL COMPANY
CINCINNATI 23, ··· OHIO

vacationing, said he was personally worried over the international situation with regard to light metals. The Senator said a survey would have to be made to determine if Canada and European cartels can produce more cheaply than the United States. He said that in the prewar period these cartels were almost unbeatable, and that unless they were watched it could grow even worse in the years to come.

He also proposed that the Department of Justice be given authority to re-examine the many contracts to make sure that aluminum again does not veer toward the state of monopoly in this country.

Senator Magnuson said the policy of the administration is to dispose of RFC-backed light metals plants to private industry as quickly as possible. He believes the DPC may have to lease many of the war-expanded plants for a period of years, and meanwhile try and determine what they are worth by looking at cost production figures and sales prices. During wartime conditions it is difficult to determine the value of any plant, and yet it is now that private capital has to be deciding which plants it wants and making plans to take them over.

From Hans Klagsbrunn, executive vice-president, DPC, and deputy director, surplus property, RFC, the conference learned that his department is making suveys on each plant, and that these surveys are available to interested persons. An engineering description of each plant is on hand. Then there are Brief 'o Logs, giving short accounts of each, its size and type. A market survey will soon be completed showing how best to put steel and light metals plants to work. As for purchasing the plants, cash is not needed. Some may be rented, others sold on terms.

Telling what Congress plans, Dewey Anderson, executive secretary United States Senate, special committee to study problems of American Small Business, stated that research work is being done, and investigations held to determine which plants of the DPC will be of value to the buyer when the war is over. Many plants, he states, will be poorly located, cost too much to run, too far from markets to be worth while. The Congressional committee will determine which should be left in their present location, which should be moved and which should be dismantled. All this is being done to aid the buyer.

Buyers should take a good working plan to Congress, start their action now. "Another six months may be too late," Anderson declared.

Speaking on behalf of the West Coast aircraft manufacturers, H. O. West, executive vice-president of Boeing Aircraft, told the conference this industry desires to have a well integrated light metals industry close to the scene of plane production.

We have five main desires, Mr. West said, first, a source of material close to our factories; second, an integrated industry, combining all our different needs; third, we would like to work closely with the light metals people in research work; fourth, there is a need for better material—mainly in making the metals more workable; fifth, lower cost of metals and material. Reduction of cost can come from having the industry close at hand thus reducing the inventory, improving scrap reclamation, development and research, and from an integrated industry.

Men named to the committee to continue the study of the Pacific Coast light metals industry are business leaders from eleven states represented by the council. The men are: Al Bauer, Portland manager; Oregon Shipbuilidng Corp. John Beall, Portland, president Beall Pipe & Tank Co.; Benjamin Benovski, New Mexico School of Mines; Earl Braden, Spokane paper & Stationery Co.; James L. Bradford, Las Vegas, Nev., general manager Magnesium Casting Co.; Ernest L. Mathy, San Francisco, Victor Equipment Co.; Maurice Mann, New Castle, Wyo.; Tom Moffett, Tacoma, Hooker Electro-Chemical Co.; A. F. Moriarty, Phoenix, Ariz.; Bryant Myer, Los Angeles, general manager, Kinney Aluminum Co.; Harlan Peyton, Spokane, Peyton Investment Co.; Dr. Delworth Walker, University of Utah, and one man to be named from either Montana or Colorado.

Cited for Awards

• • • **The following companies** have received Army-Navy "E" awards for outstanding war production:

Army-Navy "E"

McKay Co., McKees Rocks, Pa. (fifth star)
Babcock & Wilcox Co., Bayonne, N. J. (first star)
Eclipse-Pioneer Division of Bendix Aviation Corp., Teterboro, N. J. (second star)
Kerrigan Iron Works, Inc., Northside Plant, Nashville, Tenn.
American Blower Corp., Detroit and Dearborn, Mich., plants (fifth star)
Davenport Besler Corp., Locomotive Works, Davenport, Iowa (third star)
Independent Pneumatic Tool Co., Aurora, Ill. (fourth star)
Chicago Vitreous Enamel Product Co., Cicero, Ill.
Jones-Dabney Co., Louisville, Ky.
Lavelle Aircraft Corp., Newtown, Pa.
National Waterproofing Co., Camden, N. J.
Pennsylvania Tool and Mfg. Co., York, Pa.
Proctor & Schwartz, Electrical Division, Philadelphia.
Verson Allsteel Press Co., Chicago.
White Sewing Machine Corp., Cleveland.
Wycombe Garage & Machine Shop, Wycombe, Pa.

General Electric Establishes Flight Research Organization

Schenectady

• • • **A base for** flying laboratories designed to speed through scientific and mechanical tests new military and civilian aerial developments, such as the actual harnessing of jet engine and gas turbine power for new-type planes, will be established at Schenectady County Airport by General Electric Co., it was announced recently by D. C. Prince, vice-president in charge of the general engineering and consulting laboratory.

C. G. Talbot has been appointed manager of the new Flight Test Division of General Electric, which will have control of this test headquarters. N. F. Frischhertz, now stationed in Brownsville, Tex., where General Electric has tested many aviation developments now being used by the armed forces, is the assistant manager.

Work on a hangar and ground laboratory will begin immediately at the airport, Mr. Talbot said. This hangar and laboratory will be 160 ft. wide, 180 ft. deep and 45 ft. high in the center. Two floors of laboratories, work rooms and offices will run down one side. In front will be a high control tower with all of the latest electronic and mechanical equipment.

"This testing base will be completed and in operation in the fall," Mr. Talbot, who has been conducting flight tests for General Electric since shortly after the war began, said. "It will put the actual flight test operations in close contact with engineers of the company and research laboratory facilities. That is certain to speed many new developments into actual use on military and civilian planes."

Some of the General Electric developments already scheduled for flight laboratory tests are: jet turbines and gas turbines, armament devices, autopilots, electronics, instruments, electrical power systems, communications, power apparatus.

If you paint Zinc-Coated products

CHECK THESE 6 POINTS

Here are six questions and answers about paint characteristics on two different zinc-coated sheet steels. Checking them may help save you time and money.

			Ordinary Galvanized Steel	Armco Galvanized Paintgrip
✓	1	Does it take paint without pre-treatments?	No	Yes
✓	2	Is the full-weight zinc coating intact?	No*	Yes
✓	3	Is paint "insulated" from the zinc coating?	No	Yes
✓	4	Does the zinc surface rob paint of its oils?	Yes	No
✓	5	Will paint adhere . . . without premature peeling or flaking?	No	Yes
✓	6	Does paint resist scraping or other abrasive action?	No	Yes

*Acid etching, used as a pre-treatment for painting, destroys part of the zinc coating.

THIS TELLS THE STORY OF TRIPLE PROTECTION

Advantages of ARMCO Galvanized PAINTGRIP over ordinary galvanized for all painted products are clearly illustrated in this "peel-off" drawing.

The full-weight galvanized coating is "insulated" from the paint finish by the mill-Bonderized PAINTGRIP surface treatment. On ordinary galvanized there is no "insulation." The zinc robs paint of its oils, causes it to become brittle.

Actually it costs less to use ARMCO PAINTGRIP sheets than to use ordinary galvanized and acid-etch before painting. And PAINTGRIP keeps the paint on your products looking better longer.

Write for the free ARMCO PAINTGRIP booklet. It gives complete information on fabricating, finishing and applications of this steel. Just address The American Rolling Mill Company, 2471 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORP.

GALVANIZED PAINTGRIP ARMCO STEEL

Special-Purpose Sheet Steels

THE AMERICAN ROLLING MILL COMPANY

PERSONALS

• • •

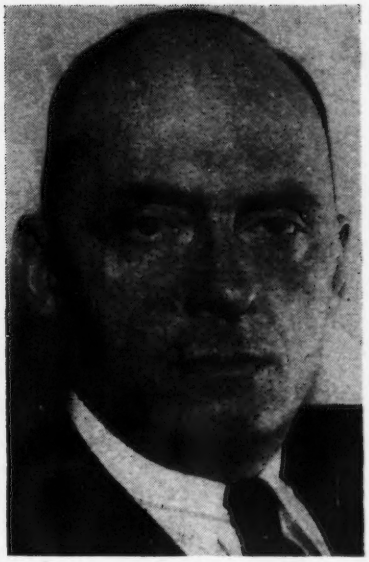
• **Carl B. McLaughlin** has been made head of the recently established Engineering Service Division, Tube Turns, Inc., Louisville, Ky. Mr. McLaughlin formerly was associated with the company's Pittsburgh office. He was a metallurgist-engineer with the U. S. Steel Corp. prior to joining Tube Turns in 1943.

• **D. C. Prescott** has joined the sales staff of the Baldwin Locomotive Works for the North Central district with headquarters in Chicago. Mr. Prescott formerly was mechanical engineer for the Union Pacific Railroad at Omaha.

• **Stephen J. Pylar** has joined The Billings & Spencer Co., Hartford, Conn., as plant manager. For the past 17 years he has been connected with the Chevrolet-Forge Division of the Chevrolet Motor Car Co. in various supervisory capacities.

• **S. Riley Williams** has been appointed director of international business, Worthington Pump & Machinery Corp., Harrison, N. J. He will direct all Worthington's foreign and export activities and will supervise the operation of the corporation's associated companies in foreign countries. Mr. Williams' 25 years of service with the company has all been in the European operations.

S. RILEY WILLIAMS, director of international business, Worthington Pump & Machinery Corp.



GEORGE H. DOWDING, director of industrial relations, and NATHAN WESTON, assistant director of industrial relations, Chicago district, Carnegie-Illinois Steel Corp.

• **George H. Dowding** has been appointed director of industrial relations, Chicago district, Carnegie-Illinois Steel Corp., succeeding **Peter V. Martin** who has accepted an assignment with the Foreign Economic Control Council. Mr. Dowding has been associated with the company since January, 1919. **Earl H. Fyler,** formerly assistant to the Chicago district director of industrial relations, has been appointed to succeed Mr. Dowding at the South Chicago plant. Mr. Fyler has been associated with the company in Gary and Chicago for the past 15 years. His position on the district industrial relations staff is being taken by **Nathan Weston,** formerly on the staff of the vice-president of industrial relations in Pittsburgh.

• **Dr. O. S. Duffendack,** director of research, North American Philips Co., Inc., Dobbs Ferry, N. Y., has been appointed vice-president and director of research and engineering, and **E. J. Kelly,** manager of manufacturing, has been made vice-president and general factory manager. Dr. Duffendack was formerly professor of physics at the University of Michigan. Mr. Kelly was formerly works manager of the Camden plants of RCA.

• **D. A. Newton** has joined the F. J. Evans Engineering Co., Birmingham, Ala., as air-conditioning engineer with headquarters at the Atlanta branch office. **Nelson B. Buehrer** has joined the company's Birmingham office and will direct sales throughout the South.

• **E. J. Hergenroether,** recently resigned chief of the metallurgical branch of the WPB Steel Division, Washington, D. C., has resumed his duties with the Development & Research Division, The International Nickel Co., Inc., New York. Mr. Hergenroether will direct the division's automotive steel development and will make his headquarters in Detroit.

• **William B. Stout,** chief of the research division, Consolidated-Vultee Aircraft Corp., has been appointed to head postwar automobile development for Graham-Paige Motors Corp., Detroit. The services of Mr. Stout were obtained through agreement with Consolidated-Vultee to whom Mr. Stout is under a long term contract.

• **R. R. Rees,** former manager of the Packard Motor Car Co.'s Toledo division since its acquisition two years ago, has become director of purchases. with headquarters in Detroit. Mr. Rees is succeeded at the Toledo plant by **W. H. McCoy.**

• **Sidney E. McCrum** has been appointed assistant advertising manager, Wickwire Spencer Steel Co., New York. Mr. McCrum was previously assistant to the advertising manager of the Chicago Pneumatic Tool Co., New York.

• **C. Roy Anderson** has been appointed works manager, Johnson Gage Co., Bloomfield, Conn. He was formerly assistant superintendent of the Gage Department, Pratt & Whitney Division, Niles-Bement-Pond Co.

PEYTON M. MAGRUDER, director of commercial sales, and JOHN H. HUMPSTONE, assistant director of commercial sales, The Glenn L. Martin Co.

FRANK A. SCHOTTERS, vice-president in charge of production, The Crosley Corp.

• **Peyton M. Magruder** has been appointed director of commercial sales, The Glenn L. Martin Co., Baltimore, Md. Also named to new positions were **John H. Humpstone**, assistant director of the commercial sales group in charge of export sales; **Howard Stansbury**, sales engineer of the Mars and other flying boats; and **John E. Soenke**, domestic commercial sales and manager of special projects. Until the end of the war, their new activities are in addition to their present war assignments.

• **J. H. Slater**, assistant manager, Cleveland district, Republic Steel Corp., Cleveland, has been named acting manager succeeding **J. L. Hyland**, manager, who has been given a leave of absence to become a deputy chief of the metallurgical branch, U. S. Control Council in Germany. **H. L. Allen**, open hearth superintendent, has been appointed acting assistant manager.

• **Clyde Williams**, Director of Battelle Memorial Institute, Columbus, Ohio, in tribute to his leadership in advancing industrial science, has been presented the degree of Doctor of Science by the Case School of Applied Science, Cleveland, Ohio.

• **Lloyd W. Hemingway** has been added to the engineering development staff of the Whiting Stoker Co., and assigned to Whiting Stoker Sales Co., Chicago.

• **William R. Manske** has been appointed works manager of the Denver plant, Amsco Division, American Brake Shoe Co., New York.

• **Richard E. Merrell** has been named sales promotion manager on all AC replacement products, AC Spark Plug division, General Motors Corp., Flint, Mich., and **Earl McGinnis**, formerly advertising manager, has succeeded Mr. Merrill as manager of national account sales. **Frank E. Ray**, formerly assistant advertising manager, has become advertising manager.

• **Donald S. Zimmerman**, manager of the Chevrolet assembly plant at Atlanta, has been named manager of the Norwood assembly plant. He succeeds **Floyd R. Lyness**, who is being transferred to the management of the Kansas City assembly plant.

• **David F. Austin**, vice-president in charge of sales of the Carnegie-Illinois Steel Corp., has been appointed acting vice-president—sales, United States Steel Corp. of Delaware, succeeding **Avery C. Adams**, resigned.

• **Roger Williams**, assistant general manager of the explosives department, E. I. du Pont de Nemours & Co., Wilmington, Del., has been elected a vice-president and a member of the Board of Directors. Mr. Williams also succeeds **Dr. Charles M. A. Stine**, retired, as adviser on research and development to the executive committee.

• **N. F. Lawler** has been appointed director of advertising and sales promotion of the Nash Motors division, Nash-Kelvinator Corp., Detroit. Mr. Lawler succeeds **C. D. Wing** who leaves to rejoin Maxon, Inc., Detroit, as an account executive.

• **Frank A. Schotters** has been named vice-president in charge of production of The Crosley Corp., Cincinnati, Ohio. Mr. Schotters was formerly works manager of the Western Cartridge Co. plants, East Alton, Ill., and prior to this connection, he had been president and general manager of the Luce Mfg. Co. of Lansing, Mich.

• **John E. Ricker** has been appointed general superintendent at Kropp Forge Co., Chicago. Mr. Ricker has recently been with Republic Steel Corp. in the field service metallurgical department.

• **T. C. Sykes** has been appointed district sales manager for the Philadelphia area, Atlas Fence Co., Philadelphia.

• **J. C. Lucas** has been appointed to establish a new management engineering department of the Meehanite Metal Corp., New Rochelle, N. Y. Mr. Lucas was formerly assistant to the general superintendent of the Bucyrus-Erie Co.

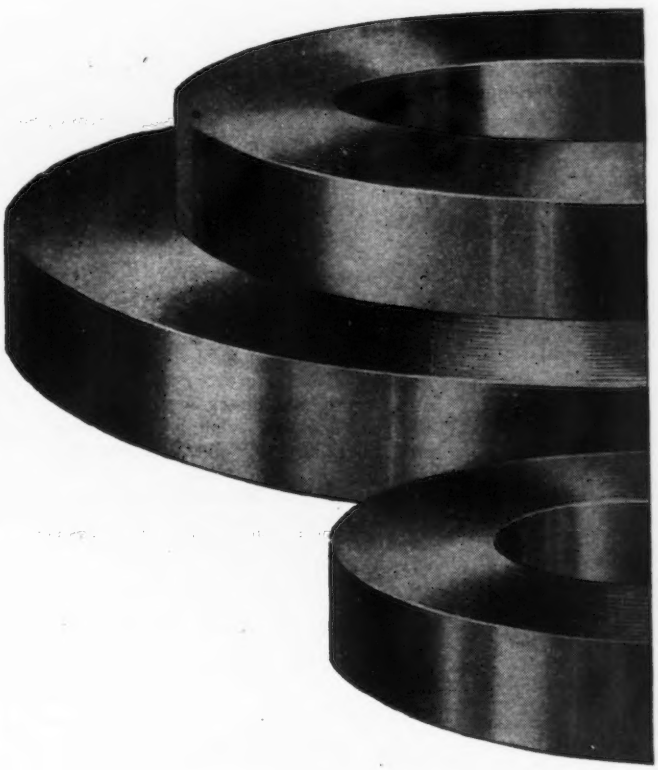
• **John M. Metes** has been made export manager of Clyde Iron Works, Inc., Duluth, Minn., a subsidiary of Barium Steel Corp.

OBITUARY...

• **Myron J. Czarniecki**, vice-president in charge of sales for A. M. Byers Co., Pittsburgh, died suddenly June 18. He was 53 years old. Mr. Czarniecki had been with the Byers company since 1913.

Follansbee
COLD ROLLED STRIP

produced by Craftsmen



Follansbee craftsmen—backed by the tradition of generations of fine steel-making—are producing Cold Rolled Strip with the same skill demanded of other high quality Follansbee steels and steel specialties.

They find little difficulty in adhering to specifications—in delivering Cold Rolled Strip required for most usages.

It is sometimes possible for them to adjust crowded production schedules to accommodate orders to meet unusual situations—the result of the flexibility which only a compact, skilled organization possesses.

You are invited to put Follansbee craftsmanship to the test—on Cold Rolled Strip or other steels. Write, wire or telephone the General Offices . . . or the nearest District Sales Office or Agency.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES • PITTSBURGH 30, PA.

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, Houston, St. Louis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle; Toronto & Montreal, Can. *Plants*—Follansbee, W. Va. & Toronto, O.

ALLOY BLOOMS & BILLETS, SHEETS & STRIP • CLAD METALS • COLD ROLLED CARBON SHEETS & STRIP
POLISHED BLUE SHEETS • ELECTRICAL SHEETS & STRIP • SEAMLESS TERNE ROLL ROOFING

Dear Editor:

FOREMEN GROUP OBJECTIVES

Sir:

On p. 96 of the May 24 issue Thomas E. Lloyd stated that the National Association of Foremen was one of three large groups organized for collective bargaining purposes. Never was there a statement so wholly untrue. In its 22 years of existence this organization has always said that foremen are definitely a part of management. Our membership is made up of thousands of men in 32 states from all ranks of management from assistant foremen up to and including presidents of companies. Thirteen per cent of our membership at the present time consists of men in executive management level.

Through the medium of our foremen's clubs where all levels of management can meet and discuss their problems, the association has done more than any other group to raise the standards of foremanship and to promote the appreciation of foremanship as a profession. Through the voluntary efforts of thousands of past and present NAF officers and directors, unity of thinking has been created in many, many companies.

H. J. POST,
Managing Director
National Association of Foremen,
Dayton 2, Ohio

● We deeply regret the error and recognize what embarrassment the statement must have caused.—Ed.

HALF-TRACK PRODUCERS

Sir:

Please give us the names of manufacturers of half-tracks similar to those in use on Army trucks.

ROBERT W. JEFFREY,
Vice-President
Daniel Jeffrey & Sons,
Jeanerette, La.

● The manufacturers of half-tracks are the Diamond T. Motor Car Co., Chicago, the White Motor Co., Cleveland, and the Autocar Co., Ardmore, Pa.—Ed.

SHEET AND STRIP SOURCE

Sir:

Kindly inform us of steel mills located east of the Mississippi River who manufacture sheet and coil stock, primarily those mills which are not operating at full capacity.

STANLEY F. LEVY
Fibrcan Corp.,
Whitestone, L. I., N. Y.

● All mills are now operating at capacity permitted by current labor and temperature conditions. However, a list of producers of cold rolled sheet and strip has been mailed.—Ed.

GALVANIZED DRUMS

Sir:

We should like information on the use of electro galvanized sheet steel in the fabrication of repeat shipper drums for the petroleum and chemical industries. Please inform us of any mill or drum manufacturing concern who might have had experience along this line.

H. M. MILLAR,
Steel Container Division
Service Station Equipment Co., Ltd.,
101 Hanson St., Toronto 6

● A review of the commercial setup of barrel manufacture in the U. S. is contained in "Steel Mills Capture Barrel & Drum Industry" from the issue of Sept. 21, 1944, tear sheets of which have been mailed.—Ed.

METAL STAMPINGS WANTED

Sir:

There is an increasing demand for toys made of metal and we are interested in contacting metal stamping concerns who might be interested in going into manufacturing of these items on a profitable scale. We would be interested in working on a contract basis, direct affiliation or royalty. Are any of your subscribers interested?

ARTHUR DRITZ
Vitaplay Toy Co.,
115 West Broadway, New York 13

BEARING METAL

Sir:

Kindly send me a reprint of "Copper-Lead-Silver Bearings Developed by Ford," in the March 29 issue.

E. J. GILMORE
Cleveland Graphite Bronze Co.,
Cleveland

● Tear sheets have been mailed.—Ed.

SHELL TRIMMING

Sir:

In a recent issue there was an article on pinch trimming steel shells with carbide dies. We should like to have that article for reference. Would it be possible for you to send us a reprint?

P. F. H. REICHERT,
General Manager
Reichert Float & Mfg. Co.,
Toledo 6

● A tear sheet of "Thin Gage Sheet Deep Drawn With Carbide Dies" from the issue of March 15 has been mailed.—Ed.

FURNACE BRAZING

Sir:

Will you let us know where we might be able to get information on electric furnace brazing?

DAVID MAUGER, III,
Materials Engineer
New England Auto Products Corp.,
Pottstown, Pa.

● Sending tear sheets of "Electric Furnace Brazing Being Widely Extended" from the Nov. 16 and 23, 1944, issues.—Ed.

NEW COPPER ALLOYS

Sir:

We should appreciate your sending us a reprint of the article in your June 7 issue on "Recent Developments in Copper Base Alloys." We are interested in making photostatic copies of this article for distribution to our personnel.

W. W. SIEG,
General Manager
Titan Metal Mfg. Co.,
Bellefonte, Pa.

● Tear sheets have been mailed.—Ed.

METAL CUTTING

Sir:

Will you kindly send a reprint of the article "Super High Speed Cutting of Metals," which appeared in the May 10 issue.

M. R. WOOD,
Director of Engineering & Research
General Aircraft Equipment, Inc.,
South Norwalk, Conn.

● Tear Sheets have been mailed.—Ed.

ELECTRONIC CONTROL

Sir:

Please send me a copy of the article "Electronic Sorting and Testing," in the Nov. 4, 1943, issue.

C. BROTHERTON,
Chief Inspector
Caterpillar Tractor Co.,
San Leandro, Calif.

● Tear sheets mailed.—Ed.

COMPARATIVE COSTS

Sir:

We seem to recall having read an article dealing with the future of electric furnace steel giving data on the costs of different types of steel and comparing with open hearth costs. Can you tell us when it appeared?

JOHN KRUESI.
Vice-President
Southern Ferro Alloys Co.,
Chattanooga 2, Tenn.

● This article was "Postwar Prospects for Basic Electric Furnace Steel," July 28, 1944.—Ed.

MACHINERY WANTED

Sir:

We are manufacturers of manicure files, tweezers and medical forceps, and would be interested in locating a supplier of machinery for cutting the files. We would wish a firm quotation, together with detailed specifications, illustrations, etc.

We are also interested in plastic moulding, and would be pleased to have data on machines for compression and injection moulding.

J. KLOSTER.
Manager
Flexible File Co. of Australia Pty. Ltd.,
Sydney, Australia

● Names of manufacturers of file cutting machines and plastic presses have been mailed.—Ed.

HIGH TENSILE STEELS

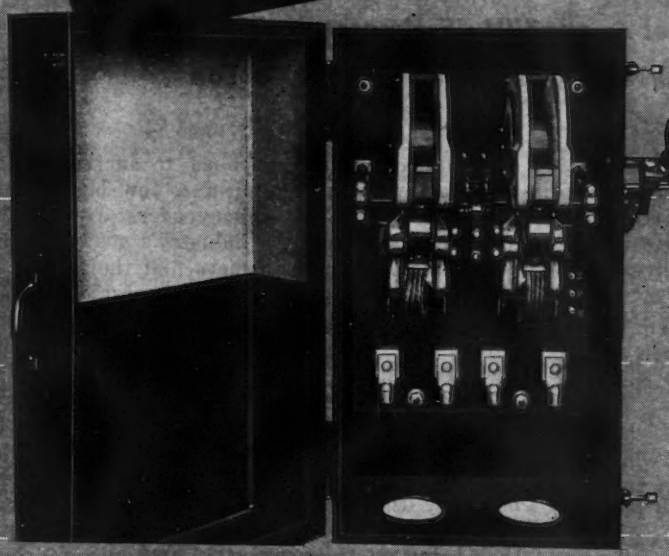
Sir:

You are to be congratulated on the article by F. D. Foote, "High Strength Steels Pace Lightweight Development," which appeared in the June 14 issue. I should greatly appreciate three copies.

P. F. NYDEGGER,
Superintendent
Singer Manufacturing Co.,
Elizabethport, N. J.

● Tear sheets have been mailed.—Ed.

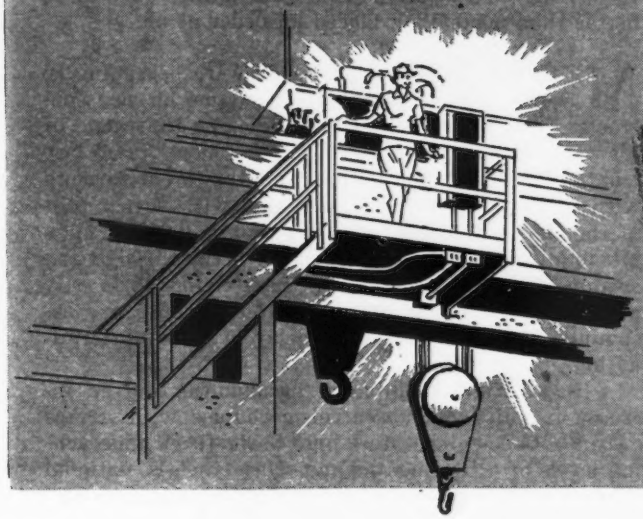
new Safety Disconnect Switch for D-c Cranes



1 Manual-magnetic type for ease of operation.

2 LINE-ARC design for high arc-rupturing ability.

3 Designed with parts associated with crane control to reduce the replacement-part problem.



● Safety rules in many industrial plants and laws in several states require a safety disconnect switch on overhead traveling cranes, mounted at the point where the operator enters or leaves the crane. These switches disconnect the crane from the main collector power-feeders running along the crane runway.

Previously, operators, especially women, have had difficulty in opening and closing disconnect switches of the manually operated type.

This new EC&M *Magnetic Type* Disconnect Switch meets all the requirements of ease of operation, safety, convenience and reliability. It is of double pole design, completely enclosed and has side-type, externally-operated handle with thumb-latch which holds handle in either open or closed position. Pushing the handle up closes the switch, pulling it down opens it—a cam roller forces contacts open, if necessary, and also insures against accidental closure due to vibration or an impact blow from another crane on the same runway. It allows for up to three padlocks for locking switch open.

New publication 1024, just issued, gives complete data on ratings, sizes, dimensions, etc. Copy will be mailed promptly upon receipt of your request.

THE ELECTRIC CONTROLLER & MANUFACTURING CO.

2698 EAST 79th STREET • CLEVELAND 4, OHIO

This Industrial Week . .

- **Shell Steel Cutbacks Replaced with Rated Orders**
- **Sheet Steel Availability Estimates Not Uniform**
- **Scrap Firm with Composite at $19.17 a Ton**

WHILE substantial shell steed cutbacks made last week at St. Louis were being replaced by rated orders involving rails and structurals, there was still difference of opinion in the steel industry and in Washington as to the availability of the greatly sought-after steel product—sheets.

Most steel centers were of the opinion that it would be late third quarter and probably early fourth quarter before sheets in any substantial quantity would be moving to civilian manufacturers. On the other hand the WPB position this week is that the supply of flat rolled material will ease somewhat during the latter half of the third quarter when military cutbacks are expected to be reflected at mill levels in substantial quantities. Issue, however, has been taken with WPB Chairman J. A. Krug's estimate of 300,000 tons of sheets to be available for nonrated business in the third quarter.

Despite the differences in estimates, it may possibly be that the full force of past and present military cancellations may reach the mills in one lump during the third quarter. Such a condition envisioned by some would substantially change the reluctance of steel mills to give commitments on nonrated deliveries.

In the Cleveland district this week one sign of things to come may be the ability of one mill there to offer a substantial quantity of sheets for delivery during the third quarter. Other signs of an earlier than expected opening in the sheet log jam are a long awaited revision of the shell container program and unofficial reports of a cutback in Navy shelter contracts. Whether or not these changes will be sufficient to bear out the more optimistic ideas on availability of sheets soon remains to be seen. The WPB holds considerable tonnage for sheets which must be placed as rated orders.

The shell contract cutbacks held the spotlight at Pittsburgh this week with practically every producer of heavy shells being affected. Noted in the cutback program was the plan of moving shell contracts further west in order that the finished product would be closer to the source of use. Many of the contracts cancelled in Pittsburgh were transferred to plants in the west. The bomb program shows no signs of easing up. During the third quarter more than 200,000 tons of pipe have been slated for bombs, while in the fourth quarter the amount may approximate 232,000 tons.

THAT oil companies may still find it difficult early next year to obtain what supplies they desire is seen in a contemplated upping of the bomb program in the first quarter of 1946 to perhaps 270,000 tons of pipe, and in the second quarter of that year, subject to considerable change, the allocation might possibly run as high as 400,000 tons. Pipe requirements for bombs are in the three or four sizes commonly used by oil companies. Headed by automotive requirements unvalidated orders continued to increase in volume this past week. Aside from a few large consumers, most individual non-rated orders are considerably smaller in size than the industry's average during the war period. As these orders find their place on mill schedules, a climb in production costs is expected to become more pronounced, the reason being that orders will call for various sizes and types as compared with the "straight run" war orders.

Unrated buyers now are said to be convinced that there is little hope for shipment earlier than the late third quarter or early fourth quarter except for spot openings. Judging from past steel market history, however, the desire of non-rated buyers to stand on the sidelines will be short-lived because they realize that being on the backlog of even unrated orders is better than not having placed an order at all.

MEANWHILE steel companies were beginning to worry about the holdup in claims on war contracts. One steel producer has indicated that none of his claims has been approved in more than two months, whereas prior to that time they went through without any trouble. It is said that with 50 per cent of the claims amounting to less than $10,000, a huge pile up of paper work may suddenly break through and swamp steel producers. Since these claims form only a basis for final negotiation, steel companies are becoming apprehensive over the delay in speeding terminations.

Heat fatigue, equipment breakdowns and an increase in quits and absenteeism coupled with strikes continue to keep the steel ingot rate from approaching levels of a few months ago. Nevertheless, national ingot operations gained two points this week to 91.5 per cent from last week's revised rate of 89.5 per cent. The rate, however, is expected to drop next week since there may be some loss due to Fourth of July curtailments. Some districts are threatened by a hot metal shortage due to an unusually large number of blast furnaces being down for repairs plus a tighter scrap situation.

Miscellaneous market news this week included: heavy wire inquiries for wire for bed springs and spring mattresses; a strong agricultural wire and fence demand; an increase in structurals inquiries and an increase in authorizations by WPB bringing to 614 the number of railroad passenger cars now scheduled.

Concrete bar makers, although satisfied at the release of this product from WPB control, nevertheless realize this item will have to compete for space and material with rated orders. This may mean that the picture for concrete bar consumption is not yet as glowing as the WPB action at first indicates.

Scrap supplies were tighter this week. Because of a 50c. a gross ton rise in the Philadelphia market, THE IRON AGE scrap composite price gained 17c. a gross ton to $19.17, the ceiling price average.

• **STRUCTURAL STEEL BOOKINGS**—May bookings of fabricated structural steel for bridge and building construction reported to the American Institute of Steel Construction by companies representing 74.5 per cent of the total average bookings of the industry during the years 1923-25, total 45,296 tons as compared with 94,610 tons reported for the preceding month and 34,840 tons reported for the corresponding month of last year. The reported shipments for bridge and building construction totaled 54,444 tons compared with 50,651 tons reported for the same month last year. The reported tonnage available for future fabrication at May 31 was 165,733 tons.

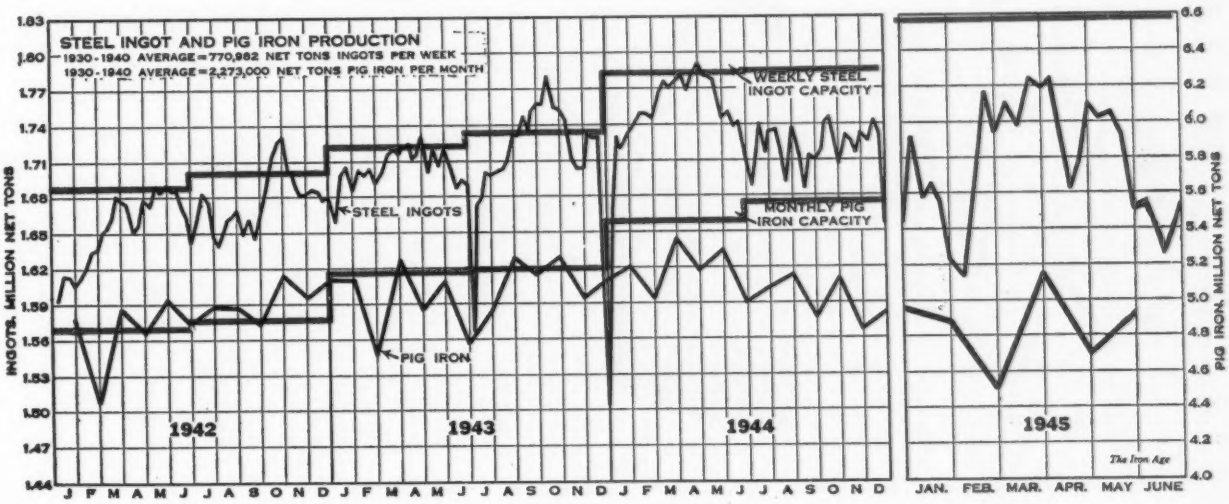
• **WAR FILMS**—To emphasize the need for continued war output for the war not yet half won, the Industrial Incentive Division of the U. S. Navy has prepared numerous combat films for distribution to war plants and labor unions. Available for the "smokestack circuit," that is restricted to workers on the production line in war plants and shipyards in 16 mm.. and 35 mm., these films are timed for showing at shift changing and lunch periods and are, therefore, short, seldom running over 22 min. They may be obtained through the Industrial Incentive Division, Navy Department, 2118 Massachusetts Avenue, N.W., Washington 25. The current group of subjects include the following title: "Your Mistake, Tokyo," "The Admiral Replies," "Advance Base," "Okinawa" and "The Battle Ahead."

• **RAW MATERIALS FOR WAR**—In achieving its remarkable production record during the three years and five months between the attack upon Pearl Harbor until the defeat of Germany, the iron and steel industry of the United States consumed approximately 375,000,000 tons of iron ore, 187,000,000 tons of coke and 155,000,000 tons of scrap, according to the American Iron & Steel Institute. Those amounts equal consumption in the eight years from 1932 through 1939. Vast quantities of other raw materials were required, also. Last year alone, in its blast furnaces and steelmaking furnaces, the industry used 311,000,000 tons of raw materials, exclusive of ferroalloys and alloying elements. This was approximately the same total as the tonnage of basic raw materials charged into similar types of furnaces in 1943.

• **TO RETAIN PIG IRON CONTROLS**—After its tight inventory position was outlined to them by WPB officials, members of the Pig Iron Advisory Committee unanimously recommended continuation of the controls on pig iron. Most controls on pig iron are currently incorporated in M-17. It was pointed out by WPB officials that if M-17 were revoked at this time, the steel order M-21 still would give WPB authority to allocate pig iron wherever necessary, but that the latter order does not contain the 30-day inventory restriction, continuation of which, it was declared, is considered necessary at this time.

• **IRON ORE STOCKS**—Total iron ore stocks at furnaces and Lake Erie docks as of June 1 soared to 20,714,738 gross tons, more than 4,300,000 tons higher than May 1 levels, but still behind the 21,473,619 tons on hand on June 1 last year, according to the current report of the Lake Superior Iron Ore Association. During May, ore consumption by U. S. and Canadian furnaces totaled 6,872,461 gross tons, slightly more than April's 6,641,552 tons, but somewhat less than the 7,557,762 tons consumed in May, 1944, the report showed. Cumulative ore consumption for the season totaled 33,949,212 tons compared with 37,178,170 tons in the same period of 944.

• **AUTO STEEL OUTLOOK**—As yet the tonnage of steel estimated as military surplus this year and earmarked for automotive and other civilian production has not materialized a bit. Cutbacks at producer levels, Detroit and elsewhere, are not permeating down to the mills. To meet this contingency, WPB has instituted what it calls Program 48, consisting of a letter to all industrial plants urging them to turn in their steel tickets at once when they get a cutback, plus a personal call from a WPB representative when a cutback occurs, to check up on the steel cancellation situation. What the agency hopes to forestall in that manner is the erstwhile contractor letting steel come to his plant on allocation, then reporting it as surplus and buying it for his own use, right out of his own yard.



Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
June 19.....	84.5*	95.5	90.0	92.0	94.0	106.5*	91.0	54.0	84.5	77.5	67.0	75.0	91.5	89.5*
June 26.....	85.0	95.5	92.0	93.0	98.5	106.5	91.0	93.0	96.5	78.5	71.0	75.0	93.5	91.5

* Revised

A different Johnny is marching home

For one thing, he won't parade up Main Street the way you always expected. He doesn't much care for the ticker tape and bunting. By day coach or sleeper, Johnny is coming home with the experiences of battle vivid in his memory.

He may be back for the job he left when the call to colors came. You know you'll be proud and happy to have him with you.

But it's a *different* Johnny. Not quite the happy-go-careless guy you knew before. He's older for one thing. More thoughtful. You may even find him brusque or restless now and then.

Why?

When a man's been through the hell and pandemonium of battle . . . or the terrible boredom of lonely, inactive outposts, it's hard to readjust to a paradise of peace and plenty. It will take Johnny time to settle in a civilian groove, and the call's on you for friendly tact and patience.

Pull with Johnny. Give him time to come through at home, as he came through on the fighting front. Play ball with Johnny. He made a swell soldier. And he's going to make a swell civilian.

MACWHYTE COMPANY, 2911 Fourteenth Avenue, Kenosha, Wisconsin . . . manufacturers of "Hi-Fatigue" Aircraft Cable, "Safe-Lock" Cable Terminals, Aircraft Tie-Rods, Braided Wire Rope Slings, and Wire Rope for all requirements.

Few DPC Aluminum Plants Scheduled for Postwar Operation

Washington

By JACK R. HIGHT

o o o

• • • **Aluminum reduction plant** disposal, in the opinion of informed government officials here, will probably result in the postwar operation of not more than two or three of the major government-owned reduction units.

The over-expanded productive capacity of the industry, plus the present anti-monopoly position of the Federal Government will combine to limit the interest of Alcoa, Reynolds, and other possible producers in leasing or purchasing DPC plants.

See West Coast Column page 92 for Light Metals Meeting Report.

Not even the most optimistic of industry or government officials feel that there is reasonable hope of operating war-expanded facilities at near 100 per cent of capacity in the near future, but the general feeling expressed here is that the overall aluminum consumption figure would be improved if an additional aluminum producer, or possibly two additional companies were to enter the field.

Quiet pessimism concerning the future of DPC aluminum capacity is heightened by the growing conviction that the Aluminum Co. of Canada, major war producer, intends to dominate the export markets which can be economically reached from plants in this hemisphere. The Canadian firm, separated from Alcoa in the twenties by a group of export-minded officials of the parent company, has always considered the world market to be its own.

Recent announcement of the release of a sizeable quantity of Canadian ingot to Spain is considered here to portend further immediate action by the Canadian firm in foreign fields.

The actual plant disposal is being delayed by the section of the Surplus Property Act which requires that the Surplus Board make known its specific policies to Congress in the form of a report on the disposal of all facilities in which the government has over $5,000,000 invested. The report is far overdue, as the act specified that the report be submitted to Congress within three months after the passage. The three months expired Jan. 4, 1945, and pyramiding congressional demands for action will doubtless force some kind of report in the very near future.

Although plants in New York and New Jersey which have been universally accepted as high-cost producers are already being partially dismantled, no actual property disposal on any important scale has taken place in the light metals field, and such disposal will doubtless await congressional approval of the plan designed for the large facilities. The same general rules will thus be used for all aluminum plants disposal.

Certain sections of the court decision in the Aluminum Co. of America anti-trust case seriously limit sale or lease of war-born facilities to Alcoa, even if that company should decide that it needs additional aluminum reduction facilities.

Informed government officials feel that the position of the Olin Corp., wartime operator of one small aluminum production unit on the West Coast was made clear in the recent testimony of that company before the hearings of the Senate Small Business Committee. The position is best described, from a postwar standpoint, as a huge question mark.

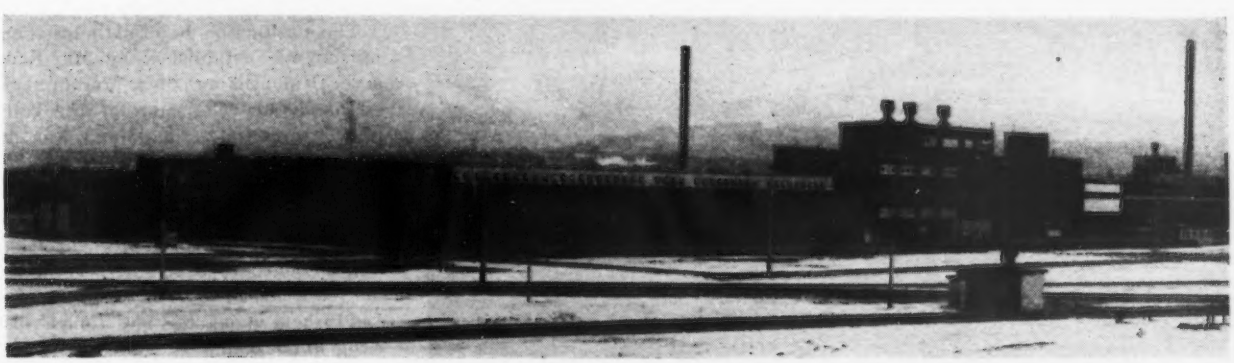
The Olin family, of Western Cartridge Co. fame, is reputed to be the second largest family fortune in the country. This firm is taking the stand that until government clarifications of future tax policy, and disposal terms are issued, as well as plans for operation of alumina plants, their postwar position in the aluminum reduction field is to be considered extremely doubtful.

Reynolds is already committed to remain in the aluminum business, with many important facilities mortgaged to the Reconstruction Finance Corp. to raise funds which were used to build existing facilities. While there are indications that Reynolds needs additional ingot capacity to balance its operations, this firm is also withholding any commitments for leasing or purchasing arrangements, until government action is taken.

While government officials do not expect more than two or three of the reduction plants to be immediately operable, they feel that the plants can be leased on a basis which will encourage their operation on a reduced scale until the war-developed bulk of secondary metal is disposed of. After that crucial time is passed, it may be possible to encourage additional producers to enter the field.

There is some hope expressed here that some new producer will be enticed into the field, to lease or purchase one of the plants. Considered ideal would be a large business organization not now producing the light metal, but

DOUBTFUL FUTURE: *Possibilities for postwar operation of DPC aluminum plants are viewed with some pessimism by Washington officials. This Spokane, Wash., carbon plant is a small unit of the major development located there, considered to have a doubtful future.*



with large capital resources. Officials hope to get such a firm to make a comparatively modest investment to start operation in one of the plants and are taking the view that it will be profitable for the government to make leasing arrangements on nominal rental basis.

Such action is justified on the basis that otherwise the plants must be dismantled, with consequent present and future losses, or must be maintained while idle by the government at a tremendous cost. Feeling runs strong among policymakers in the government against any type of outright subsidy payment, however.

Opponents of the rent-free leasing arrangement assert that it is in fact a form of subsidy, while its proponents point out that wartime producers have also had the same benefit, as their investments for war built facilities will be completely amortized by the end of the war.

All of the above plans are contingent upon the decisions being made in a series of meetings now underway here on the secondary metal problem which will become pressing at the cessation of hostilities with Japan. Government officials recognize this problem as one that could make or break the whole disposal problem, and are now considering planned long term release of the estimated 3,000,000,0000 lb. of secondary metal.

Most of this metal will be the product of the aircraft industry, about one-third of it in obsolete aircraft, like the B-24's being stored at Willow Run, and much more will be material in process in plants when contracts are canceled. If the total amount is allowed to flood the market immediately after the war, government officials feel that even privately-owned production plants will be forced to close for a period of time.

Machine Tool Export Group Plans to Invade Latin American Market

By JOHN ANTHONY

o o o

New York

• • • A number of machine tool builders have banded together recently in order to apply modern marketing techniques in the postwar sale of their products to Latin America. Identifying themselves as the Amtea Corp. (American Machine Tool Export Associates) headquarters have been established in the Empire State Building in New York and work is already going forward under the direction of Fred M. Read, manager of Foreign Sales Division of Kearney and Trecker Corp.

The association intends to maintain engineering specialists in Latin America to provide technical assistance where desired. One of its principal objectives will be to get away from the catalog type of marketing and to establish local dealerships operating specialized machine tool divisions.

Prior to the war, machine tools were not actively marketed in Latin America by United States producers, but occasionally an unsolicited order would come in. One firm that did a half million dollars worth of business there during the war had sold only $50,000 worth in the five-year period preceding it. Prior to the war the rather limited market for machine tools that existed in South America was monopolized by British and German exporters.

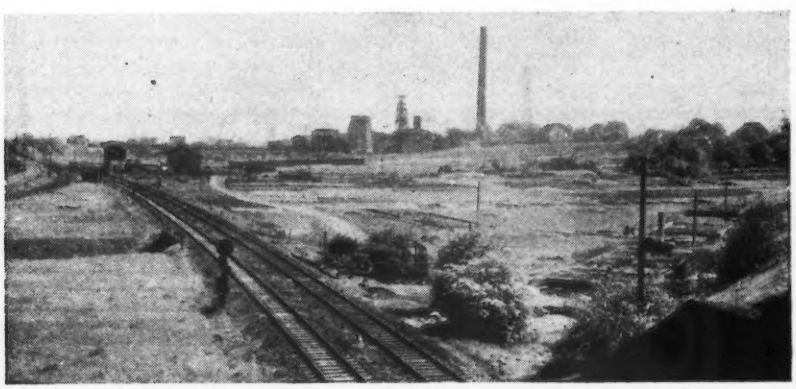
The present membership in the association includes Kearney and Trecker Corp., Lodge and Shipley Machine Tool Co., Warner and Swasey Co., Landis Tool Co., Baker Bros., Inc., Abrasive Machine Tool Co., Lake Erie Engineering Corp. and V & O Press Co. Others are now considering membership. There is said to be little or no competition between the production lines of these companies.

The corporation has been set up as a Western Hemisphere corporation under the structure of the Webb-Pomerene Act and will operate under the nominal jurisdiction of the Federal Trade Commission.

The bulk of the anticipated postwar business to be done by the association, it is believed by Mr. Read, will consist of general purpose machine tools. The most productive markets are expected to be Brazil, Argentina, Chile, Colombia & Mexico.

The officers of Amtea Corp. include Joseph L. Trecker, president; Walter K. Bailey and M. A. Hollengreen, vice-presidents; William L. Dolle, secretary and treasurer and Fred M. Read, general manager.

UNSCATHED: *One of the smaller coal mines in the Ruhr Valley, south of Dortmund. In general, condition of railroad roadbed and rails was excellent up to the time of capture.*



New WPB Committee Chairman Appointed by Krug

Washington

• • • John H. Martin has been appointed chairman of the War Production Board's Production Readjustment Committee, which handles military cutbacks, J. A. Krug, WPB chairman, announced recently. He succeeds J. D. Small, who became WPB chief of staff a short time ago.

Mr. Martin came into the rearmament program in 1940 as an aide to Donald M. Nelson and has served successive war production agencies since.

The Production Readjustment Committee was established by Mr. Krug several months ago. Mr. Martin served as deputy chairman of the committee under Mr. Small and was director of the Current Production Adjustments Division, a subcommittee.

Mr. Martin also will serve as WPB representative on the Procurement Policy Board to assist in correlating the reduction in present war contracts and procurement of new items, Mr. Krug announced.

Small Steel Producers Given No Consideration in Price Control Bill

Washington

• • • **The Price Control Bill as** passed by Congress did not take cognizance of specific recommendations made by non-integrated steel companies. The steel companies, at hearings before the House Committee on Banking and Currency had proposed a formula for OPA in fixing prices, including numerous items of cost which are allowed as deductions under the Income Tax Law.

The bill extending the Price Control Act was passed by the House on June 23. It had previously been passed by the Senate and now goes to conference to iron out Senate and House differences. Final agreement will have to be reached by June 30, expiration date of the present act, or a joint resolution passed in the meantime continuing the law until agreement is reached.

The nearest approach to meeting steel company requests was in the form of an admonition to OPA in the House Committee report on the bill. The committee expressed fear that administrative delays may at times have detracted from the practical value of soundly conceived policies. It said it considered time of the essence in case of price adjustments and urged upon OPA the necessity of providing within its organization for their expeditious handling. Red tape, the committee said cannot be tolerated. Recognition of this warning, however, would afford but little relief in the way of getting the increased prices that are wanted.

The committee centered this warning about OPA's application of its "Industry Earnings Standards." The standard permits to every industry at least its peacetime level of earnings in its "Supply Standard." The latter provides for price increases above the minimum required by law wherever maximum prices are found to impede essential supply. The committee declared that OPA in its recognition of an obligation to protect the profitability of specially situated industries and in its policy of granting individual price adjustments to relieve hardship threatening the supply of needed commodities and services has utilized a wide range of flexibility to preserve profit as a stimulus to production. Complaint, however, was made that these policies have been weakened by delays in administering them.

The House bill differs widely from the Senate bill. The outstanding difference is the result of the House's sweeping action which gives to the Department of Agriculture broad powers over food products now held by OPA.

Also the House adopted an amendment offered by Representative Dirksen, Republican of Illinois, which gives the right of appeals of OPA orders to Federal District Courts. Appeal now can be made only to the Emergency Court of Appeals whose findings are not reviewable. Administration leaders have served notice that they will exert every effort to strike the Dirksen Amendment from the bill.

Italy's Steel Output To Remain Secondary

New York

• • • **Italy's poverty in** iron ore and coal has seriously stunted the growth of a steel industry there and authorities on the subject generally agree that lack of mineral resources will continue to keep Italy a minor state industrially, the American Iron & Steel Institute said recently.

Mussolini's fascist regime made an unsuccessful effort before the war to achieve self-sufficiency in iron and steel. The effort failed, and it is reported that Germany had to ship large tonnages of semi-finished steel to Italian mills during the war to keep them in production.

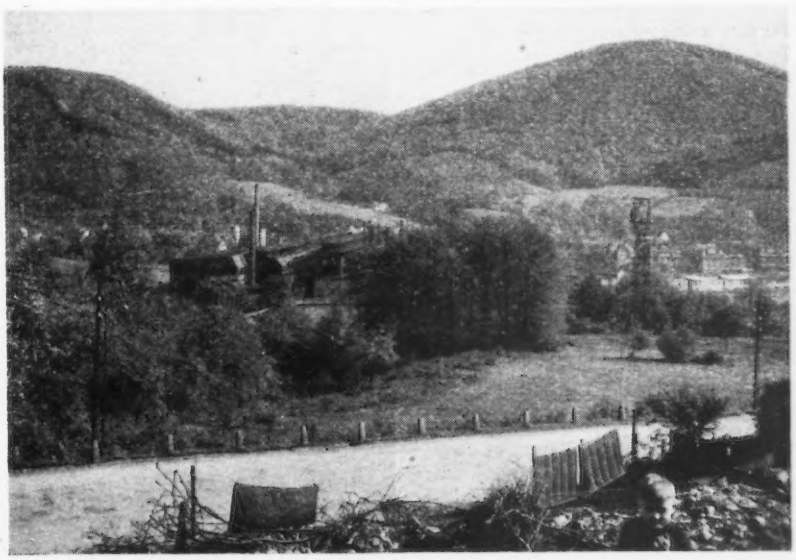
Prewar, Italy was producing about two million tons of steel a year, not much more than two-thirds of the rated capacity of her steel plants.

About 90 per cent of the iron ore used came from mines in Elba and in the Alps near the Swiss frontier. Most of the remainder came from Sardinia. All together, Italian mines were able to supply only about 25 per cent of the iron actually needed. An additional 10 per cent came from smelting in electric furnaces the ash left after making sulphuric acid from pyrite, a mineral containing both iron and sulphur.

Italy's deficiency in coal suitable for metallurgical use was even more acute than the iron situation. Only two small groups of mines yielded high grade coal and almost 12,000,000 tons of coal had to be imported annually before the war, chiefly from England, Germany and Poland.

Because the majority of Italian steel plants are located in northern Italy, they were theoretically able to operate until the end of all hostilities in Europe. It is unlikely, however, that they produced much steel during 1944 due to the cumulative effects of the blockade, air attacks and transportation difficulties between Italy and Germany.

SCATTERED PLANTS: ***Small industrial plants are scattered through the Lenne Valley, south of the Ruhr. When the plants were not directly in the line of ground advances, they often experienced no operational damage.***



Artillery Shells Cut By Half In Plants Covering Twenty States

St. Louis

• • • **The Army on** June 24 announced a readjustment of the artillery shell production program as required by the change from a two-front to a one-front war. Changes are to take effect gradually and extend until Sept. 30.

Fifty per cent overall reduction in shell manufacture affecting plants in 20 states was approved by WPB's Production Readjustment Committee composed of representatives of the Army, Navy, WMC, WPB, SWPC and Maritime Commission. WMC officials have taken immediate steps to direct workers who will be released into other vital war production in their own areas to avert any serious labor dislocation.

At a joint meeting here of Army and plant officials it was estimated that approximately 12,000 workers in 44 plants would be released by the readjustment. However, it was explained that normal attrition and turnover would reduce this figure. Reductions ordered affect manufacturers of all high-explosive shells from 57 mm. to 250 mm. as well as 90 mm. armor piercing and 75 mm. and 155 mm. chemical shells.

It was explained that complete details affecting each area must be obtained from industry plant manufacturers.

In the Chicago Ordnance District 16 contractors will be affected, with their monthly productions declining in September about 40 per cent below June levels. The volume of the cut in this district will be about $2,800,000 monthly, and represents about 6 per cent of the total ordnance district ammunition productions.

Plants which are expected to release 100 men:

Amer. Car and Foundry, Buffalo, 100; Gullet Gin Co., Armite, La., 172, July 1; Central Foundry, Holt, Ala., 220, in July; National Cast Iron Pipe, Birmingham, Ala., 143, July 1; Rockwood Alabama Stone Co., Russellville, Ala., 160, June 30; Giddings & Lewis, Fond du Lac, Wis., 175, Sept. 30; Kilby Steel, Anniston, Ala., 250, Aug. 1; U. S. Pipe & Foundry, Birmingham, Ala., 240, July 1; J. A. Zarn, Erie, Pa., 126, in August; Louis Marx Co., McMechen, W. Va., 175, July 1; Dempster Mills Mfg. Co., Beatrice, Neb., 125, in July; Glascock Bros., Muncie, Ind., 125, July; Thibodaux Boiler Works, Thibodaux, La., 161, August; United Engineering & Foundry Co., New Castle, Pa., 200, in July; Rheem Mfg. Co., Williamsport, Pa., 125, July 15; Pullman Standard Car Co., Butler, Pa., 200, in July; Peerless of America, Marion, Ind., 125, Aug. 1; Murray Co., Dallas, Tex., 140, Aug. 1.

Plants which were expected to release 251 to 500 employees:

Reed Roller Bit Co., Houston, Tex., 350, June-August; Rheem Mfg. Co., Danville, Pa., 300, Aug. 1; Bethlehem Steel, Bethlehem, Pa., 260, in July; Cribbon & Sexton, Chicago, 270, July; Goslin-Birmingham Mfg. Co., Birmingham, Ala., 340, Aug. 1; Kaiser Industries, Denver, Colo., 500, July.

Plants which were expected to release more than 500:

General Railway Signal, Rochester, N. Y., 600, July-August; Chevrolet Motors Corp., St. Louis, 800, August; Pressed Steel Car Co., McKees Rock, Pa., 600, Aug. 1; General American Transportation Co., East Chicago, Ind., 650, Sept. 1; Kaiser Co., Inc., Oakland, Calif., 700, August-September; Willys-Overland Motors, Toledo, O., more than 500, July-September; Kelly Springfield Tire Co., Cumberland, Md., 519.

Further Contract Cutbacks To Affect All Large Shell Producers

Pittsburgh

• • • **Further cutbacks** in shell contracts in this district, decided upon at an Ordnance meeting in St. Louis on June 20, affected practically every producer of shells in the larger sizes in this district. Coincidental with the cutbacks, there has been inaugurated a program of moving shell producing capacity from the plants in the East to the West Coast plants. With the war in Europe over, the needs for shell are specifically in the Pacific War theater, and by moving production capacity to the West Coast, long freight hauls which are both costly and tie up badly needed rolling stock, are avoided. Kaiser will be the recipient of at least two shell lines from the Pittsburgh district, and it is supposed that other eastern shell lines are scheduled for trans-shipment to Kaiser and other West Coast metal plants. The 8-in., M-103 line from the Jones & Laughlin McKeesport plant and an 8-in. line from Kelly-Springfield's Cumberland plant, will be moved to Denver where Kaiser will set them up and get into operation as quickly as possible.

The St. Louis shell meeting, in addition to cutting back on shell contracts, established production schedules through April 1946. The schedules, with very few exceptions, were reduced, and certain shell lines that were taken out of production were ordered to be held intact as standby equipment.

National Tube Co., at Christy Park, Pa., had four programs revised. A schedule of 65,000 90-mm. shells was canceled after July, and the equipment ordered held as standby. On the 240-mm. shell program, which called for 10,000 a month, was also canceled after July, with the equipment being held as standby. The contract for 25,000 to 30,000 220-lb. fragmentation bombs, was completely eliminated. The contracts for 250 and 150-lb. gas persistent bombs, which have not yet reached the production quotas of 50,000 per month, were unaffected. A trial order for 105-mm. il-

LIGHTERS FROM CASINGS: *The Boschi Cinelli Factory in Florence, Italy in cooperation with the Cipriano and Baccani factory, is making about 2800 cigarette lighters weekly for Fifth Army post exchanges. Old shell casings are used for the metal casing of the lighters. The flints are supplied by the Fifth Army. The company also makes electrical equipment.*

luminating shells was increased from a quota of 5000 to 25,000 a month.

Jones & Laughlin Steel Corp., another large producer of shells in this district, had two cutbacks and two new contracts. Its schedule for 8-in., M-103 shells was cut from 10,000 per month to 5000 in July, 3000 in August, and then nothing after August. It is this shell line that will be moved to Kaiser's plant on the West Coast. The 8-in., M-106 contract for howitzer shells was cut from 36,000 per month to 34,000 in July and 22,000 per month from August through April 1946. J. & L. will set up for production as quickly as possible a 105-mm. high explosive howitzer shell, the schedule for which now calls for 100,000 per month. Recently, the company started on a contract for a component of the 81-mm. mortar shell. To this was added a contract for the complete mortar shell, with a quota of 50,000 per month to start as soon as possible. It will take, it is estimated, a minimum of three months to get this item into production.

Pullman-Standard Car Mfg. Co., Butler, Pa., had a schedule for 155-mm. shells cut to 30,000 in July and then to 13,000 a month from August on through April 1946. Its contract for 30,000 105-mm. shells per month was not affected. However, one of two forging lines for 8-in. shells was abandoned, while the second line, a much newer one, will produce 22,000 forgings per month for Jones & Laughlin and 4000 per month for Oil Well Supply Co., at Oil City, Pa. A 4.5-in. rocket contract was canceled, and the equipment ordered held for emergency needs.

Weirton Steel Co., Weirton, W. Va., long a heavy producer of the larger size shells, had no changes made in its contracts. It is now producing, among other items, 30,000 8-in. shells per month.

United Engineering & Foundry Co., New Castle, Pa., was cut on a 155-mm. shell contract from 70,000 to 50,000 in July, 40,000 in August, and then the line will be converted to make a new type 155-mm. mortar shell, which has been a research item.

Kelly-Springfield Tire Co.'s shell plant at Cumberland, Md., will go completely out of production on 8-in. shells in July. The schedule originally called for 8000 shells a month, and the shell making equipment will be moved to the West Coast.

Oil Well Supply Co., Oil City, Pa., was reduced on its 8-in., M-106 howitzer shell contract from 8000 to 4000 per month. Likewise, a 50 per cent cut was experienced by Louis Marx Co., at McMechen, W. Va., on 105-mm. high explosive shells, the contract for which was cut from 60,000 to 30,000 per month.

Pressed Steel Car Co., McKees Rocks, Pa., had a contract for 75-mm. shells completely canceled. The contract was for 75,000 shells per month. Also, its contract for 105-mm. shells was cut from 50,000 per month to 35,000 per month. Armstrong Cork Co.'s plant at Beaver Falls, Pa., which has been producing 50,000 75-mm., M-64 chemical shells per month, will finish this contract in July, and the equipment at the plant will be retained as standby.

Five Giant Shovels Used in Panama Canal Salvaged by Engineers

Washington

• • • One of the biggest single salvaging jobs undertaken by the Corps of Engineers was the repair of five 120-B Bucyrus-Erie, five cubic yard, electrically operated, combination draglines and shovels. These five giant shovels had been used in important construction on the Panama Canal and had become badly worn through heavy use and exposure to the tropical climate.

Their work done in Panama, the giant shovels, costing $80,000 apiece, were needed elsewhere. Standing 27 ft. from the ground to the top of the cab, each shovel has an 80-ft. boom. Thirty-seven flat cars were required to transport the five shovels from the West Coast to the Missouri River Division Engineer Repair Shop at Kearney, Neb.

Special concrete aprons were poured to provide outdoor work areas for the repair of the machines which were too large to be taken inside the shop. Special drying ovens were also required to handle the electrical motors and parts. All bronze bushings and other parts not readily available were made in the Engineer Repair Shop. At the end of 120 days—good time for a job of that sort—four of the shovels were rebuilt and the fifth was sold to an American coal mining company for $55,000. Three of the rebuilt shovels were shipped to the Pacific for quarry work and one to Australia for coal stripping.

PRECISION CANNING: ***At the Twin Cities Ordnance Plant in an assembly line operation, conveyor belts deliver empty metal containers in which cardboard liners have been inserted. Crews of packers fill the cans with a specified number of cartridges in uniform folds. The new method of packing protects the cartridges against weather and other damage so that they arrive in perfect condition at the battlefront.***

German War Goods Being Diverted To Pacific Operations

Washington

• • • **Savings in money,** manpower and shipping space are being realized by diverting to the use of our armies millions of tons of critical war materials captured from the Nazis in the rich industrial Rhineland and Saar Valley sectors of Germany, according to reports received by the War Department.

In the Saar Valley, special engineering units are working an area of 2000 sq. miles which has yielded tens of thousands of tons of vital war materials, such as prefabricated steel truss bridges, locomotives and box cars, trucks, automobiles, road grading machines, hand tools, batteries, generators, large tractors and boats with outboard motors. In addition, huge stockpiles of steel, estimated at several million tons, have been uncovered.

Much of the goods captured in the Saar sector was packed in box cars and ready to be moved when found. In one small area more than 4500 railway cars were loaded with more than 35,000 tons of various materials. Critical supplies were hooked onto locomotives, manned by German railway men for delivery to the Seventh Army. Less needed war materials were taken to one of three huge collecting points where they are stored for future use and cars bearing civilian goods, such as food, clothing or housing materials, were railed back to France and Belgium.

Lt. Col. Charles C. Redman, Jr., 401 St. Francis Street, Kennett, Mo., is commanding officer of the engineering units engaged in the work in the Saar Valley.

"We have uncovered enough material to practically live off the land," said Colonel Redman. "While I was serving with the Army's Internal Security Control in 1941 it was my job to inventory war plants and warehouses on the West Coast of America. We did not have stockpiles then comparable to present Nazi supplies uncovered here to date.

"The Germans could have carried on the war indefinitely with the equipment and manufacturing facilities we have found in the Saar Valley. It is apparent that every German home, garage and barn was a potential warehouse or war factory. Huge quantities of materials have been uncovered in the basement of private homes and complete factories tooled to turn out munitions, arms and vehicle parts have been found in isolated livestock barns.

"I was amazed at the tremendous amount of steel the Germans had stock-piled in this area. This steel, along with the huge supplies of lumber, cement and other building materials we have found makes it apparent that the Germans have enough on hand to pursue a good postwar construction program. There is almost enough to rehabilitate some of the countries they have devastated," Colonel Redman concluded.

German civilians have been turning out products for Allied war needs. Colonel Redman said that many factories, making such items as prefabricated steel truss bridges, have been put back into operation.

Germany's world famous chemical works, the I. G. Farben Co., located in the Saar Valley, has been taken over for military use by Com Z Engineers and is now producing its first supplies for the United States Army.

At present, about 4000 German workers are employed in the giant plant which stretches for several miles along the banks of the Rhine at Ludwigshafen. Although approximately 65 per cent of its buildings were destroyed by Allied bombing, only 30 per cent of the operating machinery was lost, according to the plant's German directors.

Oxygen, at the rate of 1000 cylinders a day, is the first product to be manufactured for the Army. Production of acetylene will shortly begin. Many other products and raw materials are available and will be developed according to military needs.

More than 3000 tons of aluminum in pigs, bars, slabs, sheets and scrap have been located, while copper in lesser quantities has also been found. Two hundred tons of the latter were shipped to manufacturers in Luxembourg and Belgium, busy on Army wire contracts. German aluminum has already worked its way into G. I. mess kits and Signal Corps wire.

In all shops and factories surveyed quantities of maintenance supplies were found.

STEEL STOCKPILING: *Large reserves of steel stockpiled by Germany in the Saar Valley is now being recovered by special Army units. Industries are going back to work on regular production as fast as they can be manned and repaired.*

Sales Plan Established

Birmingham

• • • **A joint announcement** has been made by Tennessee Coal, Iron & Railroad Co., American Steel & Wire Co. and Carnegie-Illinois Steel Corp., that as of July 1, 1945, the sale of all products of these three U. S. Steel subsidiary companies will be handled by the Tennessee Coal, Iron & Railroad Co. in the eight southern states of North and South Carolina, Tennessee, Alabama, Georgia, Florida, Mississippi and Louisiana and the three southwestern states of Arkansas, Texas and Oklahoma.

The move was designed to afford a more complete and satisfactory service to the customers of the three companies involved within the area outlined.

Dreifus Active In Turnings Market In Pittsburgh Area

Pittsburgh

• • • A new consumer of carbon steel turnings has entered the Pittsburgh market within the past few weeks. Charles Dreifus Co., has started buying this item for its two crushers. Heretofore, U. S. Steel Corp. has supplied these crushers with the turnings that it wanted to crush, both carbon and alloy, but within the past couple of weeks lines have been laid by Dreifus to procure outside material. The corporation probably will be the only consumer of the production of these units, as it has been in the past, but the entry of Dreifus into the general turnings market may prove a great enough factor to cause a price advance in the machine shop item.

Machine shop prices here are still being dictated mainly by one or two major consumers. One normally heavy consumer has been out of the market for nearly two months and will continue out for about another month or month and a half, since there are still about 10,000 tons to be worked off at this company's plant.

The parallel advance in price of cast iron borings with that of short shoveling turnings is probably because borings are used as a dickering item, being just as suitable for blast furnace use as short shoveling. The total volume of borings sold is insignificant when compared to the other blast furnace grade.

On the whole, the scrap market in this area is healthier than it has been for many months. Supply is keeping up with demand except in few instances, but has not exceeded the demand in any item to a point that prices break. Another three or four weeks may find all prices again at or close to ceiling.

WPB to Stand Pat On Automobile Allocation

Washington

• • • Strong protests by the Big Three of the automobile industry—General Motors, Ford and Chrysler—over the production quotas of 241,916 cars for the last half of 1945 and 449,102 cars for the first quarter of 1946 announced by WPB on June 20, brought forth quick response that WPB has no intention of changing its position at the present time.

Charges by the larger producers that the 8000 unit quotas set for the small companies were discriminatory are based, it is said, on the fact that under the present set up, one of the Big Three would be able to furnish only one-and-one-half cars to each of its established dealers during the remainder of the year.

One WPB official, however, expressed the opinion that once the full impact of contract cancellations and cutbacks had been felt the industry might be able to produce greater quantities than provided for under the established quotas. Available steel supplies, it was said, would be adequate to meet these higher production figures.

Auto Construction Hits 115 Millions

Detroit

• • • Reconversion construction applications of the automobile industry approved thus far by the Detroit Regional War Production Board total nearly $115,000,000, an announcement of the board stated. The automotive industry, with 193 approved applications, was by far the largest applicant among the Nation's industries, whose total 754 approved applications involved $155,000,000 in all.

In Michigan, a total of 204 applications have been approved as of June 15, nearly a third of the total. Ohio, Indiana, Illinois and Pennsylvania follow in the order named.

New Production Line Is Planned by Ford In St. Louis District

Dearborn, Mich.

• • • Ford Motor Co. plans to build an assembly plant at St. Louis with daily capacity of 500 automobiles. A tract of 100 acres has been purchased on Route 66, near the Municipal Airport, for the site. Construction will begin after wartime restrictions are lifted.

Payrolls at the new plant are expected to total about 3000 persons. The building itself will be one story high, 1500 ft. long and 520 ft. wide, containing 700,000 sq. ft. of floor space.

The company plans to offer for sale its Hillcrest property, a 374 acre tract at the confluence of the Meramec and Mississippi Rivers. This property, owned by the company for several years, had been considered as a possible site for the new plant.

Ford has already announced that it will build another new plant at Atlanta, Ga., and the St. Louis operation brings the list of postwar assembly centers to 15. In addition, it is understood, there is some thinking at Dearborn on the subject of building new assembly plants on the East and West Coasts, but there is nothing definite yet in this respect nor is there likely to be for some little time.

EQUIPMENT SAVED—SOMETIMES: *Car shops at Hagen, Germany, after air and ground attack. While roof and building damage was often severe, equipment frequently weathered the war unscathed.*

Excess Capacity May Overshadow Industry's Reconversion Problem

Cleveland

• • • Physical reconversion of Ohio industry is likely to be overshadowed by the problem of utilizing excess capacity, especially when it is recalled that for a number of years before the war production was well below the maximum, according to the current report of the U. S. Department of Commerce.

Readjustment of steel production facilities will be comparatively simple, and mills now rolling ship plate can be altered to roll sheets without much difficulty. Shifting from armor plate to lighter gages will necessitate the removal of some special equipment and the substituting of other machinery not now in use, the report stated.

While steel companies can be reasonably definite about the steps they must take in effecting partial or complete reconversion, their general programs are necessarily vague as to the volume of output or the extent of employment, not because the changeover may be complicated, but due to the fact that they cannot get into full-scale normal operation until their customers have reconverted. And it is widely recognized that their customers may be delayed through lack of other materials and components.

Other statements made in the report, based on personal interviews made by Robert L. Whaley, Cleveland, regional business consultant for the Department of Commerce, follow:

Machine tool builders have virtually no mechanical reconversion problems, and their chief worry is that the industry has only a five-month backlog of orders. Beyond that are prospects for only such machines as cannot be found in the government-owned surplus. Along this line, the industry sees a real need for an adequate number of trained men to appraise Defense Plant Corp. machines and establish fair prices. It is important also that these men be given authority to scrap worthless machines. With a possible exception here or there, machine tool companies will probably turn their DPC plants back to the government.

A few machine tool manufacturers think early peacetime production may be hampered by material and parts shortages, including steel, motors, bearings, and patterns. One company expects prices to be a factor.

Some machine tool builders have expressed the hope that there will be a demand for additional sizes after the war, and an active demand is expected for chucking machines and some other types. Some that were doing sub-contracting before the war will probably continue, and others say that they may expand production of a few war items that are adapted to peacetime use.

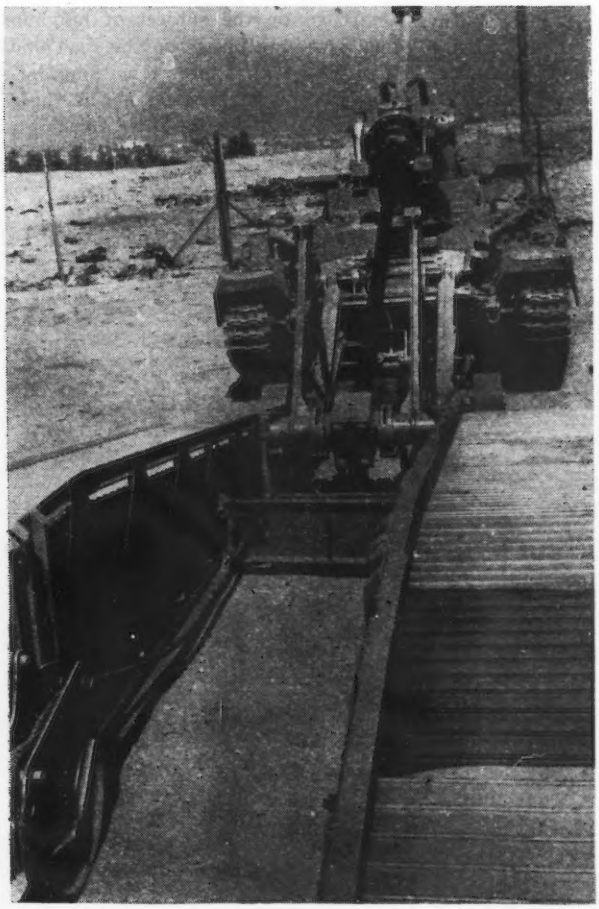
Many inquiries from South America have been reported, and foreign competition is expected to be keen. One builder predicts that Russia will be competing with us in export markets before very long.

Two other industries also interested in the prompt disposal of surplus machine tools are the tool and die people and the makers of screw machine products. One of these, the special tool and die industry, has several hundred establishments in this region, most of which are small shops averaging from 20 to 25 employees, nearly all of whom are highly skilled.

According to estimates by the National Tool & Die Manufacturers Association, the industry's 4000 to 6000 shops could use about 15,000 lathes, 10,000 milling and boring machines, 4000 presses, 21,000 grinders and other equipment to replace obsolete and worn-out machinery. Members of the industry maintain that without these replacements they will be severely handicapped in their efforts to meet the exacting demands of their customers during reconversion and postwar. Not only does this industry anticipate greater use of special tools after victory, but closer tolerances will be more common than before the war.

Obstacles to the purchase of surplus equipment, according to most shop owners, are virtually insurmountable under present conditions. As a rule, their resources are tied up in plant and equipment and there is not enough left after taxes to buy machinery. Some claim they are dipping into personal reserves to pay taxes.

The present system of pricing, government-owned machines is mentioned as another deterrent to extended purchase by tool and die shops. The present discounts for depreciation are considered inadequate in view of the hard usage undergone by much of this equipment and the expense of reconditioning. Nor, it is claimed, does the formula allow for variations in con-



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BRIDGE - LAYING TANKS: ***Used, according to British sources, to fill shell craters and make fast bridge repairs, this special tank development is disclosed as an important invasion weapon.***

o o o

dition among machines of the same age.

As in the tool and die industry, mechanical reconversion presents no difficulty for manufacturers of screw machine products. Other problems which are likely to accompany or follow the change-over are strikingly similar.

Competition from former customers and from surplus machines, and lack of funds for replacing worn-out equipment are worries. In addition, fear is expressed that the old established firms will be required to stay on war work because they are low-cost producers. In that event, the many newcomers in the field are expected to get the civilian business, or in some cases, prewar customers may start making their own screw machine products.

If costs can be held in line, it is anticipated that Ohio's nonferrous foundries can be kept busy after reconversion in spite of over-capacity and competition, by developing new uses for aluminum. Other than the substitution of molds, they have no physical reconversion task. Patterns, however, may prove a temporary bottleneck.

Stamping plants will continue largely with old customers, but some machinery will be needed for reconversion. There is no surplus of standard presses, and stamping shops anticipate a shortage of these, since most of those made for war work are of the heavier types.

Reconversion planning on the part of builders of construction machinery is complicated by the possible dumping of surplus equipment of which the armed forces have a tremendous supply. Some companies feel it should be impounded and fed out gradually.

Automobile parts manufacturers will ease into commercial production, there will be no reconversion problem and the transition will be merely a matter of making the same things, only more of them.

Sterling Gets Diesel Orders

Buffalo

• • • **The Sterling Engine** Co. has received orders for $2,000,000 worth of diesel engines for electrical generating plants to be used in rehabilitation work abroad and for western railroads, according to Addison F. Vars, president. The new business will keep the single day shift at the Buffalo plant operating on its present 48-hr. weekly schedule, without any expansion of working forces, he said.

Ammunition Storage Program Almost Set

Pittsburgh

• • • **The Army Ordnance** program of containers for ammunition storage, which will consist of a welded plate unit with a hermetically sealed-in nitrogen atmosphere is apparently fast approaching the production stage. Recent developments on the project, which is being worked out on a trial order basis by American Bridge Co., Ambridge, Pa., indicates that steel orders are about to be placed. The plate to be used is about 3/16-in. thick and total requirements are expected to be upward of 350,000 tons.

No WPB assistance in the form of allotments or rated orders will be given on this item because the completion of the project has no bearing on the Pacific War. The entire project at present is designed for storage of ammunition rather than for shipping.

In line with the storage of ammunition and the development work done on storage containers, it is believed that the Army is planning to develop a hermetically sealed container in which tanks can be stored. Dravo Corp., Neville Island, Pa., will likely get a trial order for such units. The extent of the program is not yet known. However, the magnitude of the investigative work that will be necessary before the feasibility of the plan is assured may indicate that the program will be large.

Ahearn Leads Industry Men

Washington

• • • **Vincent P. Ahearn**, secretary of the National Sand & Gravel Association, Washington, has been named chairman of the industry members of the WLB. He was formerly vice-chairman of industry members. Mr. Ahearn succeeds Frederick S. Fales, New Rochelle, N. Y., who resigned from the chairmanship because he will be absent from Washington for an extended period. Mr. Fales will continue, however, as an industry member of the board.

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BRITISH SHIPBUILDING: *According to reports from England shipyards there continue to operate at full production, despite cutbacks in this country. The ships are said to be destined for the British Far East fleet.*

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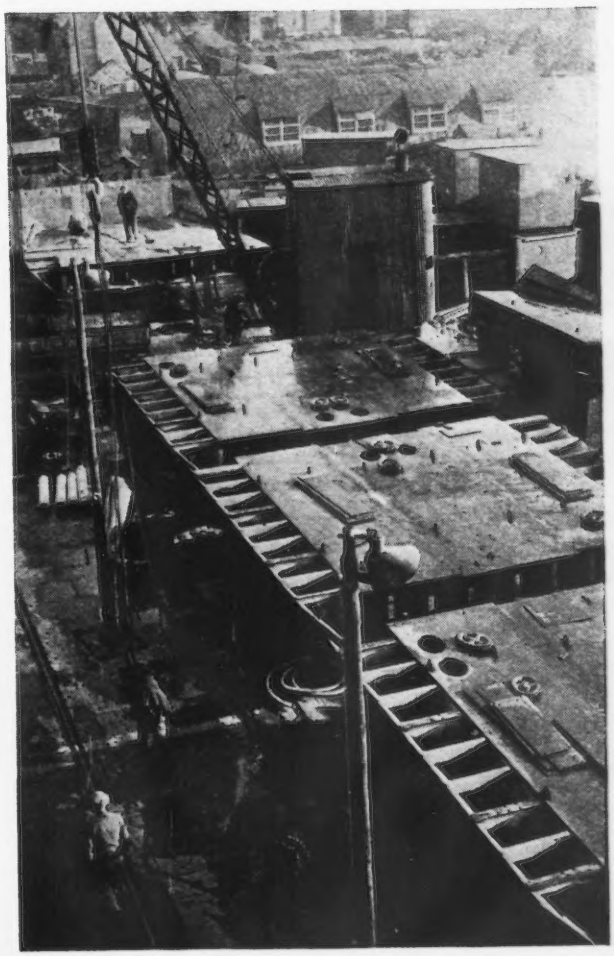


Detroit Strike Wave Reported Spreading

Detroit

• • • **Labor problems intensified** in Detroit this week as the first spell of hot weather frayed worker tempers.

After one group within the maintenance workers council of the CIO United Auto Workers Union met Monday night to consider a formula to settle the jurisdictional row raging with the AFL building trades council, another group, disclaimed by international union officers, held a rump session and voted to strike. The effect of their action was not immediately clear.

Walkouts of maintenance men of the UAW and of construction men of the AFL had by that time forced shutdown of Packard Motor Co. and Budd Wheel Co., as well as a number of contractor projects in other factories. Estimates were that more than 30,000 workers were idle because of the jurisdictional row, and more than $6,000,000 in building stalemated.

Ford Motor Co., meanwhile, was visited by a series of strikes which roused Harry H. Bennett, personnel director, to declare that the company's contract with the auto union was rapidly assuming the status of "a scrap of paper." The rolling mill was idle Monday, following walkouts last week in the spring and upset department and the motor building. Several strikes over the maintenance workers jurisdictional issue have also occurred at River Rouge.

Other strikes broke out over the Detroit landscape, at Desoto, Aeronautical Products and Stinson Aircraft. And at Briggs Manufacturing Co. workers walked out for a day in protest of the lack of meat for their sandwiches, saying their strength was being impaired. The caterer involved reported he had plenty of red points, but was unable to get anything but beans to fill his sandwiches.

Container Industry Asks More Steel

Washington

• • • **The steel container** industry has asked for an additional 50,000 tons of steel for the third quarter. The request has been made, WPB said, because of a growing backlog of unfilled orders for steel drums and pails. The move to get more steel was made at a recent meeting of the Steel Shipping Containers Industry Advisory Committee. The committee recommended that WPB's Containers Division submit the request for more steel to the central requirements committee. The committee asked that the additional tonnage be covered by directive, if possible.

WPB officials said that the apparent 50,000 ton deficit of steel for the container industry in the third quarter indicates that military and important industrial orders are increasing. An Army representative said that Army requirements for light gage steel containers in the third quarter will increase over second quarter requirements, while orders for the heavier gage containers will decrease.

Class B Products Eased

Washington

• • • **WPB on June 26** issued Interpretation 32 to CMP Regulation which explained that any Class B product manufactured on an authorized production schedule may be sold to fill any orders received, whether rated or unrated, as long as rated orders are given the precedence required by PR-1 or other applicable regulations or unless WPB orders provide otherwise. This is true, the interpretation pointed out, even though the CMP-4B application for controlled materials was filed with the expectation that all sales would be made on rated orders or on particular orders.

CMP Regulations Revoked

Washington

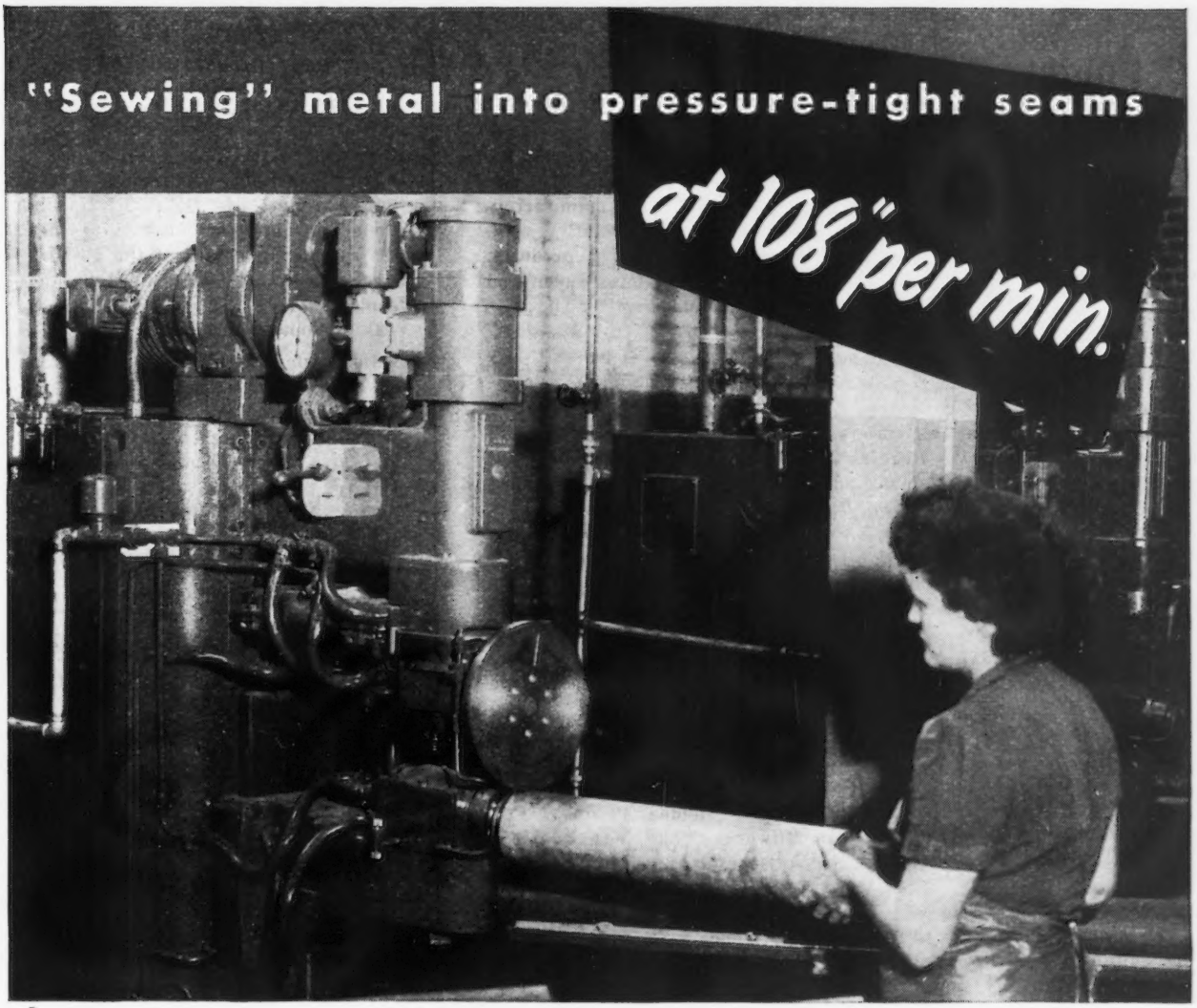
• • • **Because they will** become obsolete with the complete open ending of CMP, Direction 44 to CMP regulation 1 and Direction 5 to CMP Regulation 4 have been revoked by WPB, effective July 1. Direction 44 relates to steel not needed by producers or distributors to fill authorized controlled material orders. Direction 5 relates to the disposal of controlled materials procured by a warehouse or distributed for his stock.

PIG IRON OUTPUT: *Production of pig iron for the first five months of* 1945 *was* 21,572,938 *tons, a drop of* 1,722,035 *tons under the output for the corresponding period of last year, according to WPB Steel Division officials. Consumption continued slightly in excess of production as indicated by April demands of* 4,297,034 *tons as compared with the output of* 4,195,914 *tons. Only* 200 *furnaces were in blast in the middle of June, with* 13 *down for relining and* 13 *others idle as the result of various factors.*

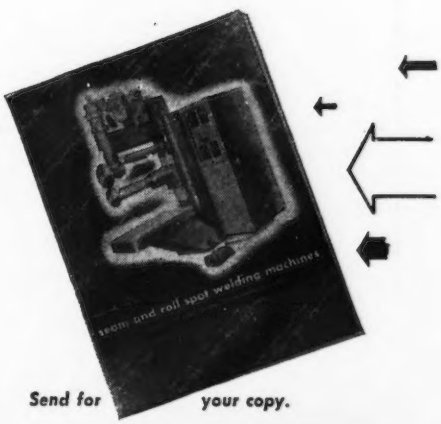
Blast Furnace Capacity and Production—Net Tons

Source: American Iron & Steel Institute

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Per Cent of Capacity	
			May	Year to Date	May	Year to Date	May	Year to Date	May	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern	12	12,988,970	851,863	4,246,170	35,342	151,635	887,205	4,397,805	80.4	81.8
Pittsburgh-Youngstown	15	25,904,240	2,025,961	9,773,009	24,318	103,359	2,050,279	9,876,368	93.2	92.1
Cleveland-Detroit	7	6,589,500	517,063	2,509,565			517,063	2,509,565	92.4	92.0
Chicago	7	14,070,510	1,057,538	5,270,569	12,914	12,914	1,070,452	5,283,483	89.5	90.7
Southern	8	4,924,670	330,689	1,595,017	11,188	68,328	341,877	1,663,345	81.7	81.6
Western	4	2,836,000	149,184	806,705			149,184	806,705	61.9	68.7
TOTAL	37	67,313,890	4,932,298	24,201,035	83,762	336,236	5,016,060	24,537,271	87.7	88.1



Lessons learned in SEAM WELDING war materials can cut <u>your</u> post war fabricating costs



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Industrial Briefs . . .

• AID TO CONTRACTORS—A Contractors Guide has been published jointly by the War and Navy Departments to aid war contractors in the settlement of their terminated war contracts. The guide discusses how to claim reimbursement for contract settlement charges and how to plan in advance of termination. Contractors may obtain this guide, without cost, from their contracting officers, or by writing to the Readjustment Distribution Center, 90 Church Street, New York 7, N. Y.

• CHANGES LOCATION — Laiser Co., Inc., Iron & Steel Division, has announced the establishment of its administrative offices under the direction of A. B. Ordway, vice-president and general manager, at the steel plant near Fontana, Calif. Heretofore, administrative offices have been maintained in the Latham Square Building in Oakland.

• CHANGE OF ADDRESS — The Wallace G. Imhoff Co., consultants in zinc coating, Vineland, N. J., has moved to 905 South Bedford St., Los Angeles, Calif.

• SELLS OUT—Arthur B. Betz, owner of the S.A.E. Steel Co., Cleveland, recently sold the company's building and equipment to a holding company of four men for a reported price of $500,000. The new owners are: Frank A. Boufford, William S. Biddle, Jr., Elmer R. Salisbuyn, and Frank A. Michell, manager of the firm.

• NEW OFFICE — Genesee Tool Co., Fenton, Mich., has established an office at 8855 Woodward Avenue, Detroit 2, with E. W. Keck in charge.

• MERGER — Snap-On Tools Corp., Kenosha, Wis., will shortly take over the property and manufacturing operations of Forged Steel Products Co., Newport, Pa., in a merger previously approved by the stockholders of the Newport firm.

• ACQUIRES PRODUCTS—Grinders & Fixtures, Inc., has acquired from Cleveland Tool Engineering Co. all manufacturing rights to the latter company's two principal products, the circular relief grinder and universal indexing head.

• RUSTPROOFED TOOLS — A graphite base rustproofing compound developed in cooperation with Socony Vacuum Co. is applied by Wendt-Sonis Co., Hannibal, Mo., to carbide tipped tools which it manufactures. The compound is applied immediately after sandblasting, and maintains the shiny appearance of the tool for several months. The compound eliminates dewaxing or degreasing of tool prior to use and avoids the affinity for dirt and foreign matter to most oils.

• BUYS PLASTICS FIRM—Eclipse Molded Products Co., Milwaukee, has been acquired by General American Transportation Corp. Early in 1944, General American acquired McCoy, Jones & Co., Inc., another plastics manufacturer, establishing the General American Plastic Division as one of the 12 divisions and affiliates of the present company.

• CONSULTING SERVICE—M. H. MacKusick, since 1941 welding engineer at California Shipbuilding Corp., Wilmington, Calif., and now acting as a consultant for them, has established, at 4310 Degnan Boulevard, Los Angeles, a consultant engineering service to handle technical and engineering problems in the welding field.

• NEW GE PLANT—To meet the anticipated postwar increase in small motors for electrical appliances and in ballasts for fluorescent lamps, General Electric has announced it has selected a site at Tiffin, Ohio, and is in the process of selecting another site for a new manufacturing plant, both to be operated under the management of the company's Fort Wayne works.

Wartime Expansion Of Steel Industry Moves Its Geographic Center

New York

• • • **About one mile south** of the little village of Dola in Hardin County, Ohio (population 175) lies the geographic center of the nation's steel industry, as determined by the American Iron and Steel Institute, it was announced recently.

Dola, which is about 22 miles east of Lima, is an agricultural community without any sign of a steel plant. Actually, the nearest furnaces are in Mansfield, about 60 miles to the east.

Dola's claim to fame is that it is the "center of gravity" of the steel industry, around which the nation's capacity for producing steel is evenly distributed on the "tons-times-miles" method of calculating.

Since 1940 the geographic center moved west about 66 miles from a point about eight miles northeast of Mansfield. Wartime increased capacity in Western and Pacific Coast states re-established the westward trend of the steel industry which had been reversed during the thirties.

The center of steel capacity moved westward an average of about 16½ miles per year since 1940, only about one-third as far as the average annual shift between 1874 and 1933.

The center shifted south approximately six miles during the war. Despite the general expansion of northern steel plants, the increased capacity of southern and southwestern plants slightly overbalanced the "tons-times-miles" factor of the northern plants.

From 1874 to 1933 the industry's center shifted gradually from Juniata County in central Pennsylvania to Crawford County in north-central Ohio. The expansion of the Pittsburgh steelmaking area and the development of the Chicago area drove the geographic center in nearly a straight line westward.

Additional capacity installed to the east of the center between 1933 and 1936 reversed the westward trend. The center retraced its path about 13 miles to the east. By 1940 the center had traveled eastward another four miles, or a total of 17 miles east of the point reached in 1933.

Wartime expansion halted the reversal; the center again moved west and spurted an additional 49 miles beyond its previous westernmost point to its present location near Dola.

CHATTER...CHATTER...CHATTER...
WAS RUINING FINISH

SUN TABLEWAY LUBRICANT...

Ended Chatter, Produced Smoother Operation, Cut Down Rejects

A midwestern manufacturer was unable to obtain a satisfactory finish in grinding hardened parts, because of excessive chatter in the grinding machines. When he used a heavy oil, the machines were sluggish. When he used a thin oil, the tableways chattered and affected the finish of the work.

After changing to Sun Tableway Lubricant, it was possible to maintain smoother operation, and to eliminate chattering.

Fewer rejects were encountered, and the management standardized on this Tableway Lubricant throughout the plant.

Sun Tableway Lubricant, with its extreme pressure characteristics and non-gumming qualities, is an outstanding example of Sun's industrial lubricants.

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OILS FOR AMERICAN INDUSTRY

PRICES

Foreign Briefs . . .

• GERMANY — It was recently reported that the Rhineland coal mines in Hamborn, which previously fed the Ruhr war factories, are now working for the U. S. Army. The mines are producing for electric power plants to supply the Americans with electric light.

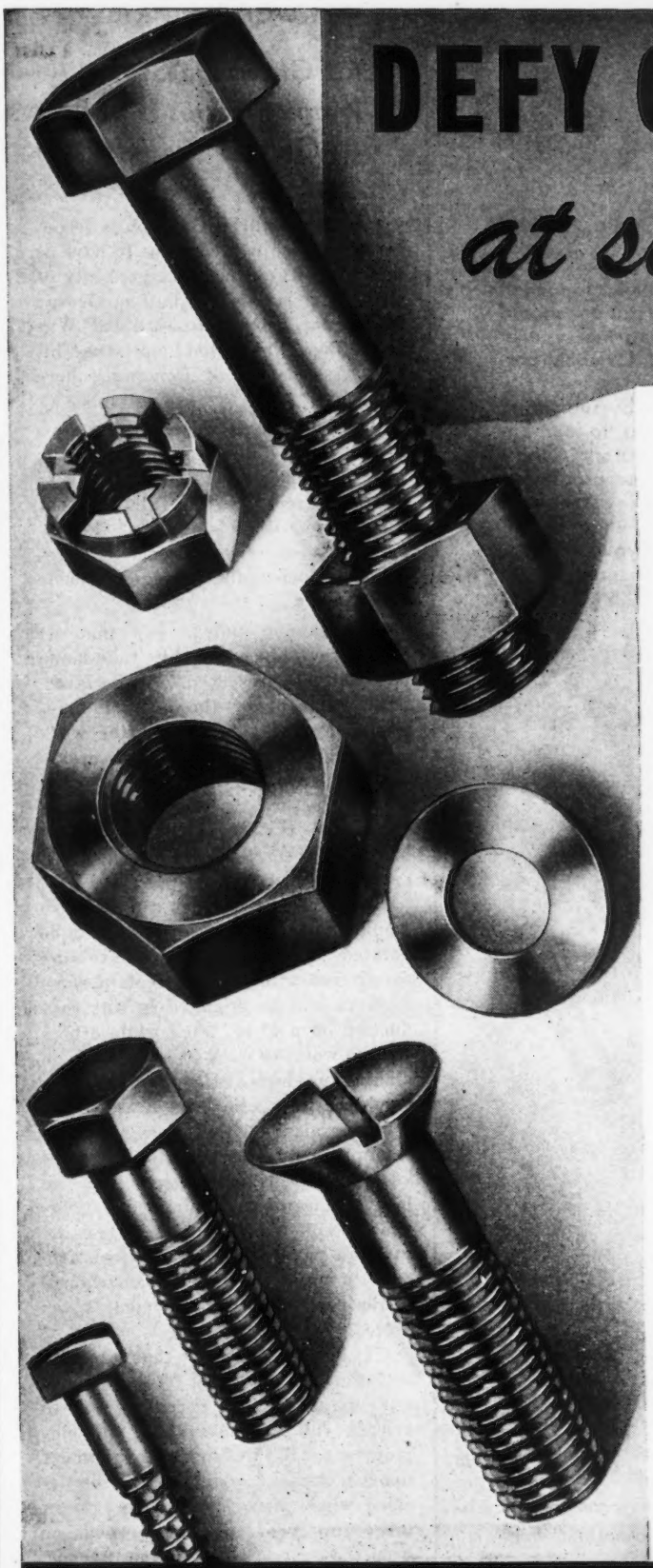
• VENEZUELA—According to the *Journal of International Economy* imports of bar steel into the port of La Guaira, Venezuela, increased to 27,431 metric tons in 1944 from the 7349 metric tons reported for the preceding year.

• COLOMBIA—According to *Iron and Steel* the Institute of Industrial Development proposes to support a project for the exploitation of reserves of iron ore estimated at 45,000,000 tons, discovered in deposits in the Santander Province.

• NEW ZEALAND — S. G. Holland, leader of the opposition in the New Zealand Parliament and F. W. Doidge, New Zealand's deputy speaker who visited Sheffield recently said that it would be economically unsound for New Zealand to put down a steel plant to meet her small requirements when products were readily available for import from Sheffield.

• FOREIGN TOOL MARKETING—Products of Owatonna Tool Co., Owatonna, Minn., manufacturers of gear and bearing pulling equipment for automotive and industrial applications, and maintenance hand tools, will be marketed abroad by Borg-Warner International. The latter firm handles foreign distribution of nine Borg-Warner divisions and seven other manufacturers.

• SWEDEN — The Aktiebolaget Bofors have been reported constructing a large ironworks at a cost of approximately 25,000,000 kroner. The Sandviken ironworks are also reported planning to spend about 5,000,000 kroner on the construction of a new plant, which will include a new cold-rolling mill and enlargement of the electric steel plant.



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Your product must stand up in use. In many cases it will meet the destructive forces of rust and corrosion.

Forestall trouble! Use Harper Everlasting Fastenings. They're made of either brass, naval bronze, silicon bronze, copper, Monel or stainless steel. They defy rust and corrosion...*and do it at small cost.*

To be sure . . . a bronze bolt costs more than a common steel one . . . but not much more. In most instances, constructing a machine or an instrument with non-ferrous or stainless fastenings adds only pennies to the total cost. Percentage wise, the added expenditure is negligible. But the life of the product . . . the ability to "take it" . . . the probability of freedom from trouble are increased beyond measure.

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Harper is known as "Headquarters for Non-Ferrous and Stainless Fastenings" . . . carries large and complete stocks of 4360 different items and is continually adding others. Write for 1945 Catalog.

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NLRB Chairman States Wage Policies Will Be Guided by Inflation

Chicago

• • • **Wage policies** during the reconversion period will continue to have as their prime guidepost the necessity of preventing runaway inflation, George W. Taylor, chairman, National War Labor Board, indicated before the Chicago Association of Commerce here recently.

New inequitable wage relationships which may develop during the "stresses and strains of reconversion" will be corrected to the fullest extent compatible with this aim, but the nation must exercise patience and restraint in demanding changes in basic wage policy.

"We cannot simply say that as hours are reduced weekly take-home pay will be preserved," he declared. "The payment of the present take-home pay for a much shorter work week on civilian goods would create such an irresistible pressure upon the price structure as possibly to bring about the run-away inflation which has so far been held in check at great sacrifices."

The mechanics of such a policy also would be difficult to work out, he pointed out, since as reconversion progresses within a single plant some workers will be engaged in war production on a 48-hr. week while others will be working only 40 hr. a week on civilian products. Equal pay clearly would be impractical.

Reappraisal of the wage stabilization program will take into account reclassifications, down grading, the loss of incentive earnings and overtime hours which may reduce the average pay for an hour's work frequently without any significant change in the type of work performed, it was stated.

"It has been urged that the full maintenance of present total consumer purchasing power is necessary now to sustain full production and full employment. Without passing judgment upon how this question should be decided when there is a prospect for a large supply of consumer's goods or even the danger of a surplus, it seems quite apparent that this is not an immediate problem at least while a substantial percentage of the nation's resources and efforts are assigned for the full time necessary for the unconditional defeat of Japan.

"Restraints on wage increases have

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been imposed by Congress because of the necessities of wartime stabilization in the interests of all our people. They should be ended as soon as resumption of the flow of consumer goods and services removes the danger of inflationary price increases and when the bidding of employers for employees' services will no longer be upsetting to the full utilization of production facilities."

Edgar L. Warren, chairman of the Sixth Regional War Labor Board, Chicago, who followed Doctor Taylor, emphasized that the board's policy as established by the Stabilization Act of 1942 and Executive Order 9250 requires stabilization against downward wage movements as well as against upward movements.

"The board visualizes the job ahead not as reconversion to the former peacetime economy, but as a conversion to an economic structure on a much higher level than the country has ever known," he declared. "The board is prepared to put all of its chips on collective bargaining."

Packaging Order Is Passed by Board

Washington

• • • **Designed to further** aid contractors and subcontractors to convert to peace production after cancellation of war contracts, WPB recently took action which permits the military to assign ratings on form WPB-542 to cover deliveries of materials for packaging and preserving government-owned material and equipment not wanted by a plant owner.

WPB will authorize the assignment of AA-2X rating for specified kinds and quantities of material to package specified items, prior to the actual date of contract termination. A rating of AA-1 will be given on or after the termination date, to help clear the plant, WPB said. Agency officials expressed the belief that in many cases this would tend to insure that the contractor could be relieved of surplus equipment within considerably less than the 60 days generally anticipated in the contract settlement act of 1944.

Lead Welding Courses Offered

New York

• • • **Plumbers local unions** are reported to be setting up classes for their men to learn the technique of lead welding. This is a process for joining lead pipe and sheet without the use of solder, since tin, an essential component, has been in such short supply.

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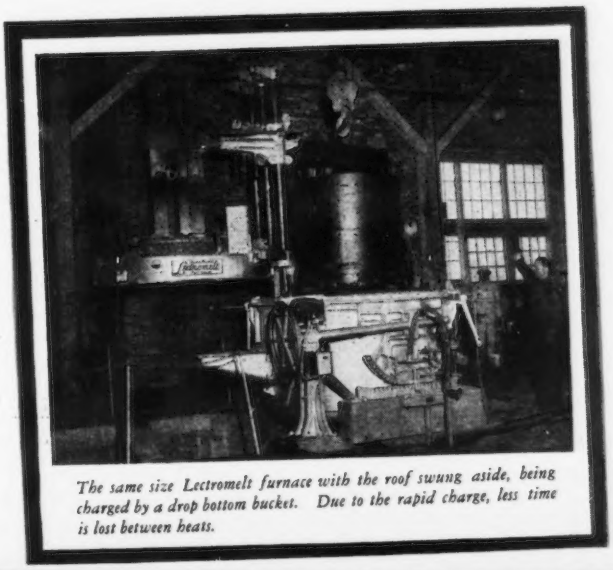

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Material Supplies For Small Firms Are Subject of Hearings

Washington

• • • Critical of the WPB reconversion program lest the "open-ending" of CMP scheduled for July 1 place small producers in an unfavorable position as far as material supplies are concerned, the staff of the Senate Small Business Committee recently issued a report preliminary to open hearings which will include testimony by WPB Chairman Krug.

With estimates of third quarter steel supplies which will be available for civilian use varying from the 500,000 ton figure set by WPB up to some 1,500,000 tons, the report points out the belief expressed by the Office of War Mobilization and Conversion in estimating between 500,000 and 800,000 tons for the third quarter that the margin on which WPB plans to operate is small and production upsets may throw the reconversion program out of kilter. This would work to the decided detriment of small business, the report said.

While reconversion analyses in terms of steel tonnage are adequate for some purposes, the belief is expressed that a further breakdown of available materials by shapes, together with components and parts supplies, should be furnished by WPB and other agencies in formulating estimates of third quarter materials available for civilian production. The WPB, it was pointed out, has not indicated that facilities necessary for production of sheet, strip and plate will have been released for third quarter civilian production nor has there been any announcement that government owned raw materials plants will be converted to civilian use.

Those facilities which are freed as a result of contract termination and are converted for civilian production in the third quarter, the committee staff declared, may prove to be an additional drain on the estimated steel supplies for the third quarter. The committee staff expresses the opinion that margins being allowed for civilian production in steel supply for the third quarter are inadequate and present a danger to small business.

Although intended to serve only as a working basis for the full Small Business Committee during the forthcoming hearings, the staff formulated

the following proposals pertaining to the reconversion program.

1. All manpower restrictions on producers of raw materials should be lifted, including ceilings, to assure maximum use of available labor.

2. Purchase orders should be screened at the mill level to prevent pre-emptive buying.

3. Restrictions limiting warehouse stocks should be removed. In addition, WPB should take steps to assure replenishment of warehouse stocks.

4. Inventory controls should be rigidly enforced.

5. Priorities Regulation No. 27 should be amended so as to permit firms doing a quarterly business of not more than $100,000 to use the preference and allotment assistance it provides. It should also permit small firms within its scope the use of a AA-3 rating or higher, provide for equal treatment of allotments granted smaller firms as compared with all other non-military allotments and define small businesses on the basis of employment in addition to dollar volume of business.

6. Proposed Priorities Regulation No. 25-a should be issued as soon as possible, preferably before the "open-ending" of CMP so that small business may avail itself of the provisions.

Forms New Materials And Products Group

Washington

• • • To consolidate the functions and responsiblities previously carried on by the WPB and the War and Navy Departments, WPB Chairman J. A. Krug has appointed a Joint Committee on Critical Materials and Products. Rogers E. Williams of WPB is chairman of the committee. The other members are Lieut. Col. N. G. Kenny, Army Air Forces and Donald L. Colwell of the Navy Department.

Mr. Krug said that the functions of the new joint committee would be:

To identify those materials or products which are now, or expected to be, in short supply and which may bottleneck war and war-supporting programs of high urgency. To determine the reasons for these shortages.

To make recommendations to reduce the shortages or improve the supply of critical materials and products.

To publish at regular intervals a list of critical materials.

WPB Materials Budget Policies Announced For Civilian Needs

Washington

• • • Policies to be followed by WPB with respect to allocations of controlled materials and production programming for essential civilian requirements on the third quarter 1945 were announced.

Unless adjustments are necessary, WPB pointed out, the level of material allotments required for essential production will be no higher than in any previous quarter during the two-front war period. WPB will proceed on the theory that requirements for a specific product code may not exceed those originally budgeted and for that reason will not amend programs unless (1) quantities prove insufficient or (2) the need for continued control arises.

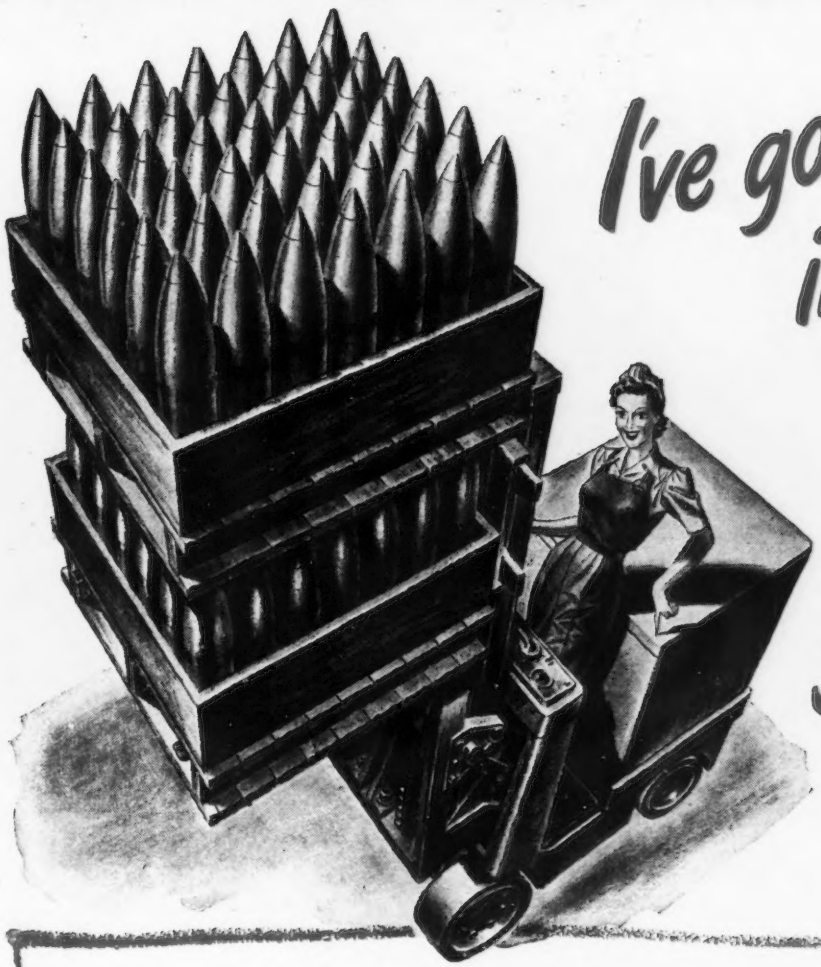
Increases in the amounts budgeted by WPB will be approved only where (1) they are insufficient to meet essential civilian and adjusted export needs, (2) military orders require an increase in programmed production, (3) greater production is necessary to break reconversion bottlenecks and (4) increased production probably cannot be obtained through CMP "open-ending" and granting priorities on individual item basis.

It is expected that substantial production in excess of the programmed levels will be secured as a result of the "open-ending" of CMP, with programming to be retained during the third quarter only so far as to assure that minimum essential requirements will be met. The WPB will continue to establish dollar (or unit) production schedules in the case of designated non-military end products.

To Open Bids on Equipment

Richmond, Va.

• • • Bids will be opened June 26 by the RFC Surplus Property Division here on 104 lots of light mchine shop equipment, most of it used. A large portion of the equipment is located at the Norfolk Navy Yard with some lots at the Naval Ordnance Plant, Elkton, Md.; the Timonium Engineers Warehouse, Timonium, Md.; the Aberdeen Proving Gorund; Edgewood Arsenal, and other points.



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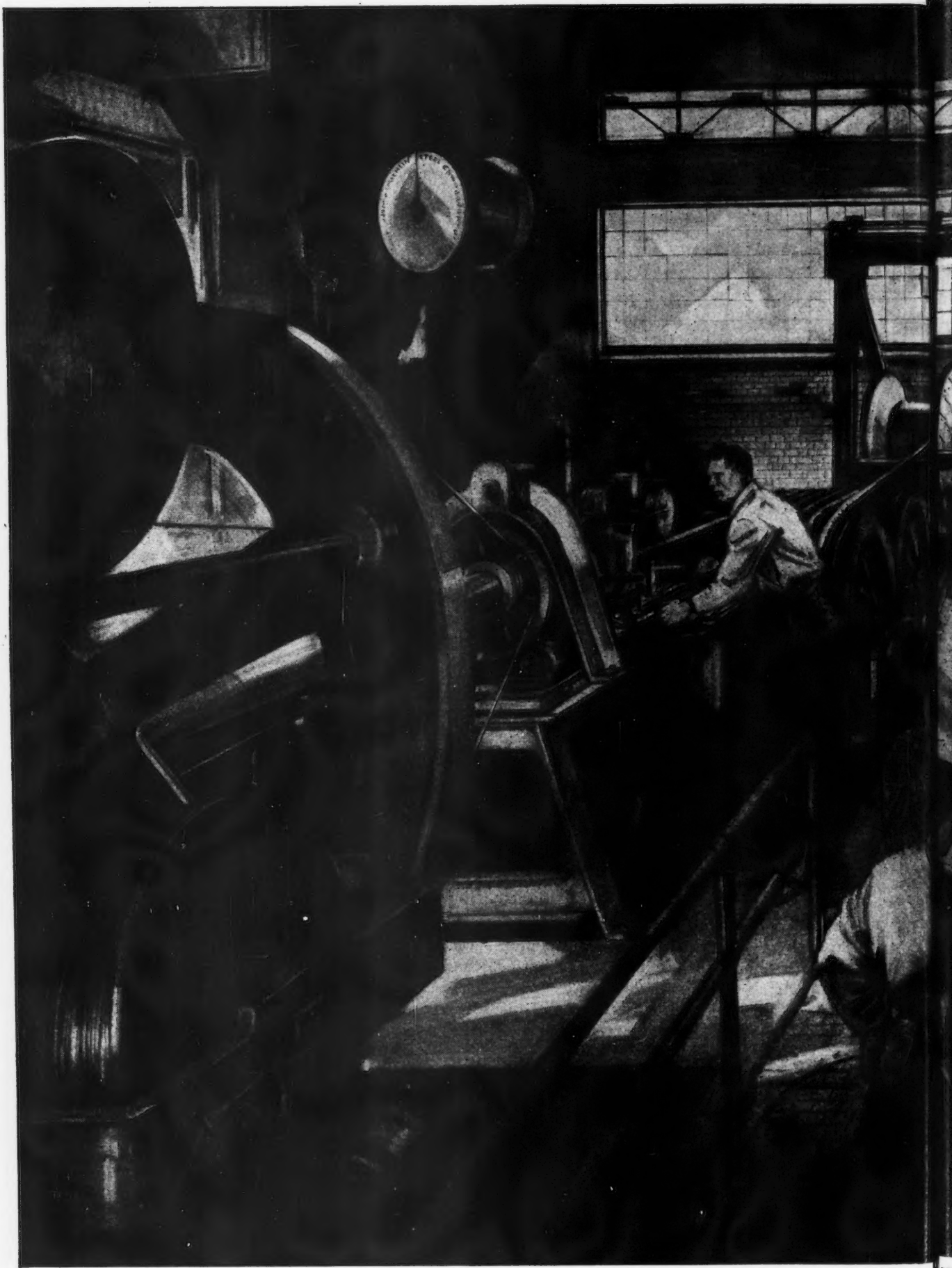

FROM AN ORIGINAL DRAWING AND SKETCHES MADE AT J&L WIRE ROPE PLANT AT MUNCY PENNSYLVANI

Unrated Orders For Aluminum Extrusions Cannot Be Produced

Washington

• • • While estimates have been made that its advanced partial open-ending of CMP on aluminum would make around 100,000,000 lb. available quarterly for civilian use, WPB in officially taking this action did not commit itself to any specific figure. It merely said that large quantities are immediately available. At the same time aluminum producers were barred from filling unrated orders for extrusions. WPB said that the supply of certain semi-fabricated forms of aluminum will not be eased. Specifically finishing equipment needed for some civilian products, it was pointed out, is almost completely devoted to military production and is expected to continue to be unavailable for less essential purposes for some months.

The new aluminum order, M-I-L, issued 18 days previous to the original date of July 1 for open ending CMP products, incorporates various reporting provisions of Orders M-1-d, M-1-g and M-1-j, which were revoked.

The amended regulation explains how warehouses shall treat different kinds of orders for aluminum.

Distributers need not accept orders bearing symbols from AM 9500 through 9599 (orders from other distributers), but if accepted, they must be treated as authorized controlled material orders, the amended regulation says. Orders bearing symbols AM 9600 through AM 9699 must be treated as deferred ("Z") orders before July 1 and as unrated orders on and after that date.

Directions 49 (Acceptance of Orders and Shipment of Aluminum Ingot) and Direction 59 (Aluminum for Certain Destructive and Similar Direct Uses) to CMP Regulation 1 were amended to permit the placement of unrated orders for aluminum ingot, to be used in alloying, deoxidizing and other "destructive" uses where the metal is not recoverable as aluminum. The directions also were brought into conformity with the "open-ending" actions.

Direction 57 (Ingot for Aluminum Foundries) was amended to make it consistent with Order M-I-L. This order provides that intra-industry orders must be endorsed with the AM identification numbers issued by WPB. Under the mended direction, foundries must use an AM number

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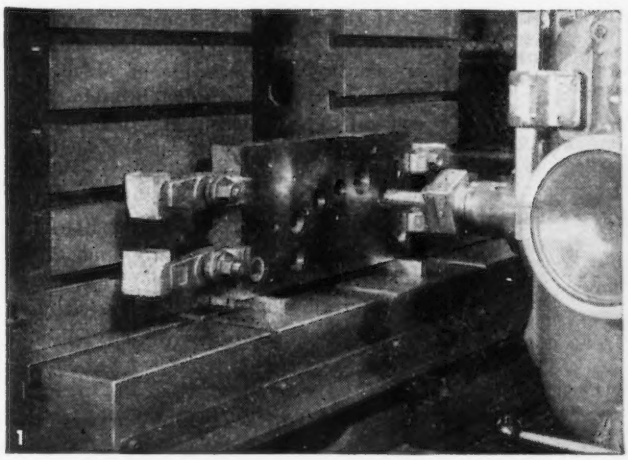

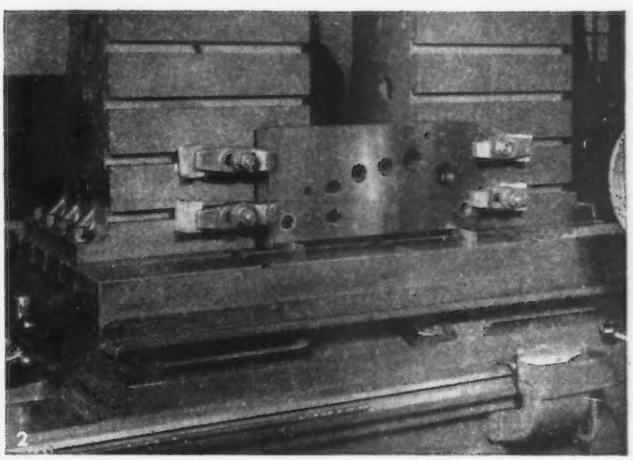

★ **No. 1—Illustration showing convenience of jig plate boring. No. 2—Eight holes precision bored. Holes spaced within .0001 with total dependence of all spacing on automatic positioning means.**

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in ordering ingot to fill unrated as well as controlled material orders for castings.

The amended CMP Regulation 1 also provides a Class B producer may use an allotment to fill his authorized production schedule for which the allotment was made or any of his other authorized production schedules within the same plant, but only for a product in the same product code listed in the WPB publication "Products and Priorities." Formerly such use was permitted for any Class B product identified by the same symbol.

Machinery Shift Causes Temporary Plant Shutdown

Buffalo

• • • **The Curtiss-Wright** Corp. has announced that operations of many departments of the two Buffalo plants will be curtailed or suspended from June 18 to June 30, when machinery and equipment formerly used in its St. Louis, Mo., factory will be reinstalled here.

Full production is scheduled to be resumed July 1, with a revised program for July and August that will make up for output lost in June.

Within three months, the company said, most of its sub-contracted work will have been returned to the two local plants. The additional work, it was said, will prevent the layoff of many employees who otherwise would have been released from the company's Buffalo payrolls because of cutbacks in warplane orders.

At the same time, Louis J. Mayer, president of District Lodge 585, AFL-International Association of Machinists, declared his union would not consent to the shifting of Curtiss employees from St. Louis and Louisville to Buffalo, "except in cases of unusual skills." He added that such transfers would require mutual agreement of the company and the union, and also a stipulation that the transferred workers could not count service in another city in adjusting seniority ratings.

Order Affects 2500 Workers

Hammond, Ind.

• • • **Maintenance of** membership and dues checkoff has been ordered by the Sixth Regional War Labor Board at the Hammond plant of Pullman-Standard Car Mfg. Co. The order involves about 2500 workers, who are represented by the United Steel Workers of America, local 25384 (CIO).

OPA Gives Shipping Point Ceiling Prices On Reusable Products

Washington

• • • **Effective June 26,** OPA has announced shipping point ceiling prices for reusable iron and steel products. In fixing these prices in MPR-310 which had covered only reusable structural shapes, plates and shafting, OPA has extended the scope of the regulation to cover all reusable iron and steel products previously in RPS-49, covering the resale of iron and steel products, except cotton bale ties.

The definition of reusable iron and steel products has also been revised to include products salvaged from structures such as storage tanks that have been installed or erected but not placed in service. It also includes iron and steel products that have been prepared for installation or erection but which have not been restored to their original condition. However, it no longer includes new materials such as crop ends of unused plates or structural shapes originating in shipbuilders' or other fabricators' yards or plants. All new crop ends of plates, structural shapes and shafting are now covered by RPS-49.

The new ceilings on reusable products are: Structural shapes, plates, bars, rods and flats, shafting, black sheets and miscellaneous products, $3 per 100 lb. in quantities up to 1999 lb. and $2.50 per 100 lb. in quantities of 2000 lb. and over. Coated sheets, $3.35 per 100 lb. in quantities up to 1999 lb. and $2.85 per 100 lb. in quantities of 2000 lb. and over.

For all reusable iron and steel products except wire rope and wire products, that require reconditioning, a maximum shipping point price of $2.10 per 100 lb. in any quantity has been established. Maximum shipping point prices for wire rope, and wire products except nails, ready for reuse without further reconditioning, were established at 85 per cent of the mill carload delivered price for the same new products at the shipping point nearest location. For wire rope and wire products that require reconditioning to make them suitable for use a maximum shipping point price of 55 per cent of the mill carload delivered price of the same new product at the shipping point nearest the location was established.

When a buyer asks that holes be drilled or punched in reusable mate-

rial, the maximum drilling charge that may be made is 10c. per hole. No extra charge, however, may be made for cutting material to lengths. Any welding, bending or cutting to diameter or pattern is fabrication, and maximum prices for items that have been welded, bent or cut are those already established for fabricated structural steel shapes, plates and bars. Maximum prices for the service of fabrication on iron and steel products not owned by the seller are established under MPR-581 covering industrial services.

Maximum delivered prices for reusable products are fixed at the shipping point price plus the established charge for transporting the product from the shipping point to the point of delivery.

Where out-of-town delivery is made in a vehicle owned or controlled by the shipper, the maximum transportation charges must not exceed the established railroad freight from the railroad siding at or nearest the shipping point to the railroad siding at or nearest the point of delivery, for the quantity shipped.

Where local delivery is made in a vehicle owned or controlled by the shipper, a maximum delivery charge of 10c. per 100 lb. may be added to the shipping point price. A minimum shipping charge of 50c. is authorized. Where shipment is made in a truck owned or controlled by the buyer, the seller may not add any transportation charges to the maximum shipping point price.

Employees Get Larger Share of Each Dollar Received for Steel

New York

• • • Payrolls last year took a larger share than ever before out of each dollar received by steel companies from the sale of their products, the American Iron & Steel Institute announced recently. The employees' share of the dollar was 40½c., compared with 40c. in 1943, 35c. in 1940 and 35½c. in 1929.

The portions of the dollar available for dividends, reinvestment, and depletion and depreciation remained low last year.

Chiefly because of lower earnings, the industry's tax cost for each sales dollar declined to 7c. last year from 9c. in 1943. Despite the decline, the 1944 tax cost still remained substantially above the level of the years

preceding the start of the war. In 1940 about 6½c. out of each sales dollar went for taxes, in 1939 the industry paid 5½c. for taxes out of each dollar and in 1929 the industry paid only 4c. for the purpose.

The tax cost computation for 1944 was exclusive of postwar refunds provided under the federal excess profits tax law. In this respect the 7c. figure is not strictly comparable with the 1943 figure of 9c., for in 1943 the amount of the postwar refund could not be excluded from the tax figures as reported.

After paying taxes, payrolls and all other expenses in 1944, only 2c. of the sales dollar remained for stockholders' dividends. After paying the stockholders only ½c. remained out of each dollar to be left in the business as a cushion for the future. Both these amounts were identical with the sums remaining for the same purposes in 1943. The 2c. going for dividends was in sharp contrast with the 4c. available for dividends in 1940, the 5c. available in 1937 and the 6½c. available for the purpose in 1929.

Whereas only 2½c. remained for dividends and surpluses last year, in 1940 stockholders and company surpluses received 8c. out of the sales dollar.

Depletion and depreciation took 4½c. out of the industry's sales dollar in 1944, exactly the same amount as in 1943, but smaller than the amount set aside in the prewar years 1939 and 1940, when 5½c. and 5c. went respectively to meet such charges.

The cost of sales and general administrative expenses was computed last year for the first time. This amounted to 2½c. of each sales dollar.

All other operating expenses in 1944 claimed 42½c. out of each sales dollar. This compared with 43½c. in 1943, 45c. in 1939 and 38½c. in 1929.

Surplus Metals And Equipment Offered

New York

• • • **The surplus property** division of RFC in New York City has issued several published listings of surplus materials and equipment as follows: No. 147, Ferrous and Nonferrous metals; No. 153 Used Machine Tools; No. 139, Auxiliary Equipment for Rolling Mills, Secondary Metal Forming and Cutting Machines and Equipment; No. 142, Special Listing of Production Equipment, including traveling cranes, conveyors, hoists, feeders, hoppers, and other equipment.

Cork Blanket For The Hydropress

(CONTINUED FROM PAGE 74)

claimed, are as follows: (1) Actually shearing-in Hydrocork from a sheet of the required thickness eliminates laborious trimming and fitting necessary with rubber. (2) No cement is required to retain Hydrocork in the cavity, thus the cork can quickly be removed and also reassembled within the die cavity in a few minutes. (3) Hydrocork is unaffected by oils generally used in this type of die. (4) It is claimed, as indicated by tests, that Hydrocork has a longer useful life than rubber used under similar operation conditions. (5) Because of its straight line compression there is a reduction in the hazard of die cavity bursting. (6) Since the Hydrocork stripper can completely fill the die cavity and fit closely around the piercing punch, the dished effect around pierced holes and other distortion of thin sheet parts are largely eliminated. Hydrocork strippers can be adopted in place of rubber without any alteration of existing dies.

A Spot Test For Molybdenum in Steel

(CONTINUED FROM PAGE 76)

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Buffalo Foundry Labor Continues Short, Loesch

Buffalo

• • • **Layoffs in the aircraft industry** have not relieved the labor shortage in Buffalo foundries, Reinhold D. Loesch, retiring chairman of the Western New York Chapter of the American Foundrymen's Association, declared in his annual report.

Few workers have been diverted to "the heavier, lower paid jobs in foundries," he said, and the majority of those sent stayed only a short time.

Although there has been an easing in high priority business of foundries since the defeat of Germany, Mr. Loesch asserted the production of most foundries still is in the essential classification.

Arthur H. Suckow, chief metallurgist of the Symington-Gould Corp., Depew, was elected chairman at the annual meeting. Other officers chosen are Henry C. Winte, vice-chairman; Leo A. Merryman, secretary, and Martin W. Pohlman, treasurer.

Directors elected for three years are John C. Goetz, Frank T. McQillin, and Avitus J. Heysel. Mr. Loesch was named a director for one year.

Welding Wire Declines From Peak Production

New York

• • • **Estimated production** of steel welding wire declined to 932.4 million lb. in 1944, a drop of 20 per cent from the 1943 record output of 1,166,400,000 lb., according to the American Iron & Steel Institute. This drop was said to be caused principally by a lower volume of shipbuilding last year. However, 1944 production is nearly four times the 1940 output.

From 1932 to 1940 the output of welding wire rose an average of 30 million lb. per year. Since then, the average increase has been 173 million lb. annually, six times the prewar rate of growth.

MACHINE TOOLS

. . . News and Market Activities

Urges Establishment Of Permanent Military Reserve of Some Tools

Chicago

• • • **Establishment** as a permanent strategic military reserve of a minimum of 50 per cent of the general purpose machine tools and production equipment owned by the government during the war was advocated by A. G. Bryant, president, Bryant Machinery & Engineering Co. and vice-president, Cleereman Machine Tool Co., before the Chicago section of the American Society of Mechanical Engineers here on June 19.

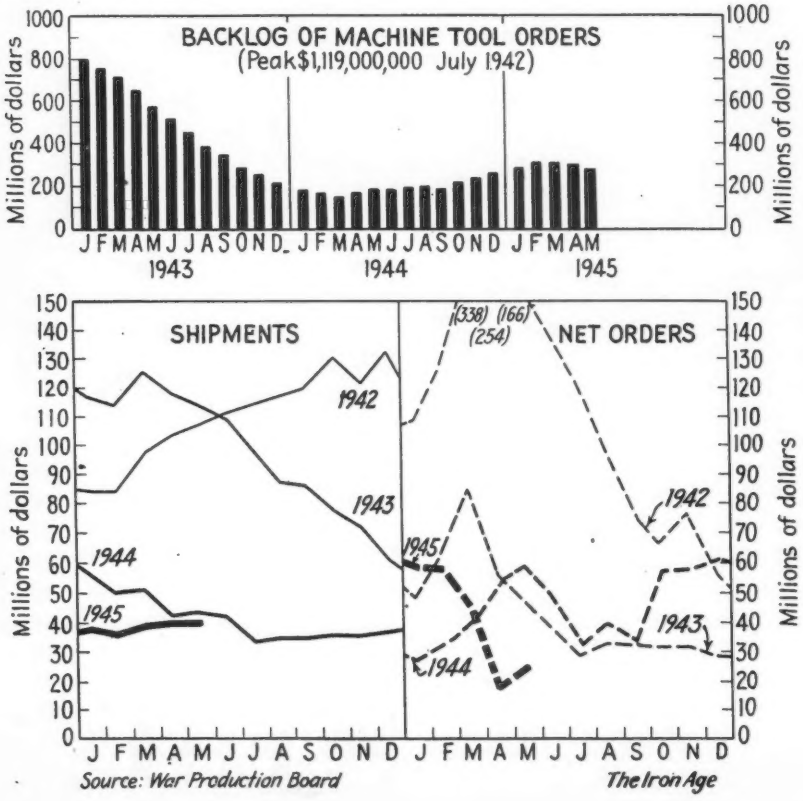
He pointed out that the rapid rate of military obsolescence would make impractical stockpiling of weapons of war as a guard against enemy assault, declaring it would be more practical for the government to keep on hand instruments of production by which it could immediately produce materiel of the latest design. Aside from affording national protection, such a course would greatly simplify maintenance of the machine tool industry on a stable basis as an integral cog in the nation's productive economy. The government holds title to over 700,000 out of approximately 1,750,000 machine tools currently in service, Bryant said.

He urged return of administration of surplus property disposal to a single administrator with full authority and responsibility, with the possible support of an advisory counsel. Simplification of restrictions as to priority of sale, reviews by the attorney general and other provisions of the present Surplus Property Act which "create confusion and cause unnecessary delay" were decried. He had praise, however, for the activities of Reconstruction Finance Corp. in the surplus machinery field.

In utilizing remaining surpluses, Mr. Bryant said "Let the president and Congress instruct the administrator and his subordinate organization to act boldly, fearlessly and with complete authority in developing cooperative arrangements with the industry."

•

• The value of net new machine tool orders received in May was $26,198,000, an increase of $7,189,000 or 37.8 per cent as compared with April, according to a preliminary report issued by the WPB Tools Division. May shipments, amounting to $39,825,000 were down 1.3 per cent under those of April, valued at $40,331,000. Unfilled orders decreased to $275,256,000 or 4.8 per cent. At the current rate of shipments, it was estimated, it will take the industry approximately seven months to ship orders on hand as of the end of May. The reports show that the number of wage earners engaged in the production of machine tools in May decreased approximately 3 per cent to 55,000 under the April employment. As compared with May, 1944, the number had decreased 11,300 or 17 per cent.



Source: War Production Board *The Iron Age*

Machine Tool Makers Still on War Work

Cleveland

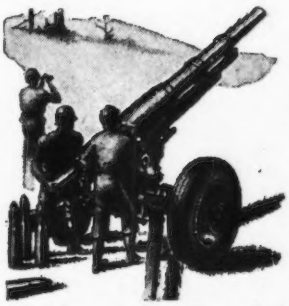
• • • **Machine tool builders,** who have been listening for the sound and the fury of cutbacks, could hear little more this week than the hum of activity in their shops where units for the rocket programs were quickly finished up; and above the din, certainly there was no note of reconversion.

During May, the pattern of orders, shipments and cancellations justified the projections of some weeks ago. Orders were down, but not much; shipments came down, but not as much as orders, and cancellations were heavy. In allied vein, unfilled orders fell off, largely because this category is still heavily confined to service business. And in the time being these are chiefly automotive and related equipment, all of which would seem to indicate that reconversion buying is not too well as yet.

On the lighter side, France is buying actively and Russia is said to be coming into the market and putting out inquiries for purchases on their own account. At the same time, builders' inventories are probably down to the lowest possible level, which will mean one less obstacle to surmount when the time arrives.

HERE'S HOW Broaching by *American* helps

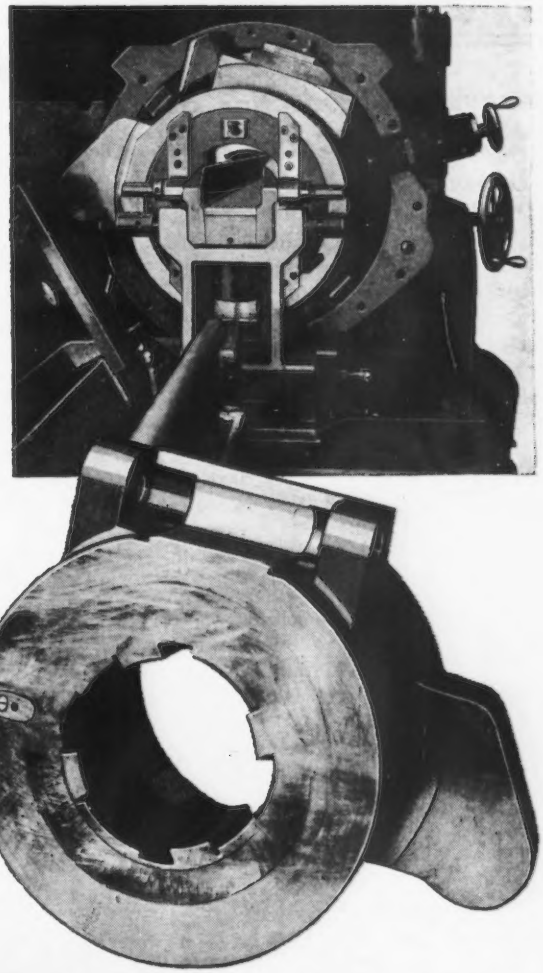
"KEEP UP THE BARRAGE"



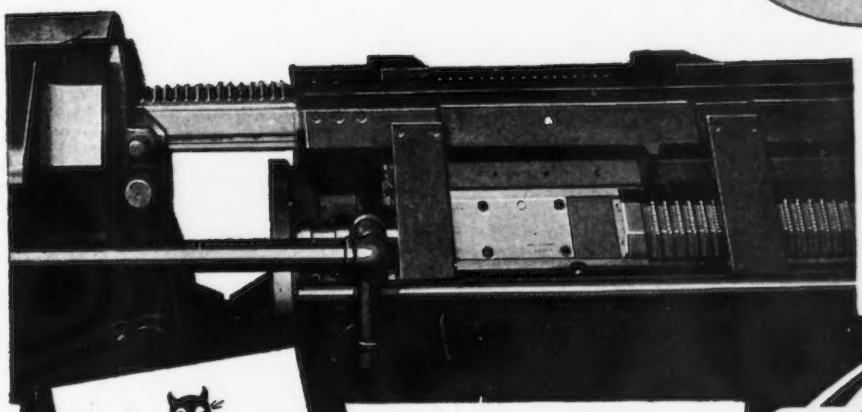
Speed — speed in production — is a prime factor in the manufacture of big guns to keep our far-flung battlefronts ablaze. "More guns in a hurry" has been a constant demand from all parts of the world.

A high rate of production—plus fine finish and absolute accuracy—has been attained by *American* engineers in designing equipment for broaching lock step slots in 8" howitzer breech rings. The setup makes use of two *American* H-60-72 horizontal broaching machines and eleven different broaches to accomplish this task.

Whether your production requires fast output, excellent finish, or accuracy to close tolerances, whether it involves the use of standard or special machinery, let *American* engineers recommend the correct broaching equipment to do the job. *American's* complete broaching service—machines, tools, and engineering—is at your disposal. Write for details today.



Slots in breech rings for 8" howitzers are broached on two *American* H-60-72 broaching machines, identical except for various broaches required for this operation. Top photo shows fixture which indexes the part one-quarter turn after each cut. Lower photo is of the finished part.



Above: American H-60-72 broaching machine, used in broaching lock step slots in 8" howitzer breech rings. Turret holds five broaches and revolves after each four cuts to bring next broach in position for cutting. A similar set-up with six-broach revolving turret is used for completing the part.

MEMBER BROACHING TOOL INSTITUTE

American

BROACH AND MACHINE CO.

ANN ARBOR, MICHIGAN

BROACHING MACHINES
PRESSES
BROACHING TOOLS
SPECIAL MACHINERY

DIVISION OF SUNDSTRAND MACHINE TOOL CO.

NON-FERROUS METALS

. . . News and Market Activities

Magnesium Production Declines During April

New York

• • • While two of the DPC magnesium plants recently returned to production by WPB order are having difficulty in getting into production because of location in labor-short areas, Painesville, Ohio, and Velasco, Tex., it is anticipated by WPB that subsequent monthly production may be pushed well above the April total of 6,412,000 pounds primary and 2,784,000 pounds of secondary recovery.

April primary production decreased 3.7 per cent from the 6,658,000 pounds produced in March due to reduced demand as a result of cutbacks.

Magnesium Production

	Pounds	
Castings	March	April
sand	6,703,000	6,238,000
permanent mold	699,000	614,000
die	266,000	182,000
Wrought Products		
forgings	28,000	51,000
extrusions	277,000	221,000
sheet, strip, plate	248,000	232,000

Bureau Research On Magnesium Cost Cut

Washington

• • • The Bureau of Mines is conducting research on various production processes for magnesium with a view toward a reduction in the cost of the metal. Five published reports on this work have now been released to the public by Dr. R. R. Sayers, bureau director.

A group of four papers in a single report are entitled, "Studies in Redistillation of Carbothermic Magnesium," and represent cooperative work by the Bureau with Washington State College. One of these papers deals with the distillation of magnesium in an electric furnace similar to that developed for electrothermic reduction of zinc. The others discuss the removal of hydrocarbon from oil sludge; briquetting; and the development of a refractory material for the furnace.

The other paper deals with the use of molten metal cathodes for the direct electrolysis of magnesium from suspensions of magnesium oxide and carbon, a process which is said to simplify cell design and increase current efficiency.

Reciprocal Trade Bill Passed by the Senate

Washington

• • • Knocking down all amendments, the Senate by a 54-21 vote on June 20 passed the three-year term reciprocal trade agreement bill in the exact form in which it was previously passed by the House. The administration had urged enactment of the measure, and scored a complete victory after heated debates on the Senate floor over many amendments that were offered only to be defeated.

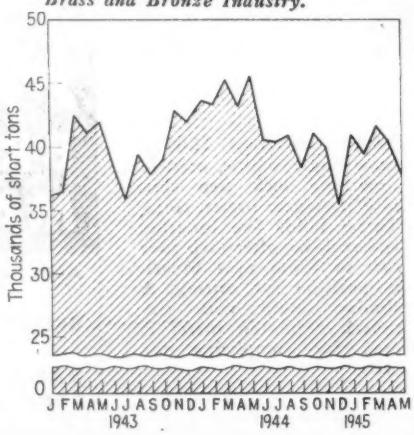
The measure authorizes the President to reduce imports duties up to 50 per cent below 1945 rates. This means that an overall slash of 75 per cent can be effected in duties which had been previously cut by 50 per cent, a category which includes many iron and steel products. This is the new feature that was incorporated in the old argreement which expired on June 12.

Aluminum Scrap Easier

New York

• • • Ingot producers here report that the market for aluminum scrap is easing and, while there have been no changes in price reported, scrap is more freely available than in recent weeks.

INGOT SHIPMENTS: *May shipments of Ingot Brass and Bronze totalled 37,262 net tons as reported by the Defense Council of the Ingot Brass and Bronze Industry.*



Reynolds Expansion Authorized By DPC

Louisville, Ky.

• • • The extrusion plant of the Reynolds Metal Co. here will be expanded and modernized to the extent of $2 million in DPC funds, it has been revealed by R. S. Reynolds, president. This will include the enlargement of the plant and the installation of new and reconstructed equipment to replace worn out machinery.

At the same time it was announced the aluminum foil plant here was also to be enlarged and equipped with auxiliary machinery expected to double the production of foil for the postwar packaging of foods, confections, drugs and tobacco products.

No Change in Prices Of Ferroalloys Seen

New York

• • • Price changes for ferroalloys are not contemplated in the third quarter, according to a prominent producer of such alloys.

While there was a temporary shortage recently of certain ferroalloys caused by a sudden glut of orders, particularly ferrochromium, supply and demand are now in balance and all requirements are said to be shipped in an orderly way.

Increase Prices Of Fire Clay, Refractory

Washington

• • • A further increase effective June 25 of 3 per cent over the March, 1942, ceiling prices of fire clay and refractory brick produced in the area east of the Mississippi River and in Missouri has been announced by OPA. A similar price increase had been granted on Jan. 8 of this year but since that time, OPA said, production costs have risen and an extra 3 per cent increase was necessary to restore earnings to their average 1936-39 levels.

Jobbers and dealers, the pricing agency announced, may add to their ceiling the actual dollars-and-cents amount of increase resulting to them from the adjusted producers' prices.

Primary Metals

(Cents per lb., unless otherwise noted)

Aluminum, 99+%, del'd (Min. 10,000 lb.)	15.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb. contained Be	$17.00
Cadmium, del'd	90.00
Cobalt, 97-99% (per lb.)	$1.50 to $1.57
Copper, electro, Conn. valley	12.00
Copper, electro, New York	11.75
Copper, lake	12.00
Gold, U. S. Treas., dollars per oz.	$35.00
Iridium, 99.9%, dollars per troy oz.	$4.00
Iridium, dollars per troy oz.	$120.00
Lead, St. Louis	6.35
Lead, New York	6.50
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb. flask, f.o.b. New York	$149.00 to $153.00
Nickel, electro	35.00
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per oz.	$35.00
Silver, open market, New York, cents per oz.	44.75
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.65

Remelted Metals

(Cents per lb. unless otherwise noted)

Aluminum, No. 12 Fdy. (No. 2)	9.00 to 10.00
Aluminum, deoxidizing No. 2, 3, 4	$6.00 to 9.50
Brass Ingot	
85-5-5-5 (No. 115)	13.25
88-10-2 (No. 215)	16.75
80-10-10 (No. 305)	16.00
No. 1 Yellow (No. 405)	10.25

Copper, Copper Base Alloys

(Mill base, cents per lb.)

	Extruded Shapes	Rods	Sheets
Copper	20.87	....	20.37
Copper, H.R.	....	17.37	....
Copper drawn	....	18.37	....
Low brass, 80%	....	20.40	20.15
High brass	....	....	19.48
Red brass, 85%	....	20.61	20.36
Naval brass	20.37	19.12	24.50
Brass, free cut	....	15.01	....
Commercial bronze, 90%	....	21.32	21.07
Commercial bronze, 95%	....	21.53	21.28
Manganese bronze	24.00	....	28.00
Phos. bronze, A, B, 5%	....	36.50	36.25
Muntz metal	20.12	18.87	22.75
Everdur, Herculoy, Olympic or equal	....	25.50	26.00
Nickel silver, 5%	....	28.75	26.50
Architect bronze	19.12	....	....

Aluminum

(Cents per lb., subject to extras on gage, size, temper, finish, factor number, etc.)

Tubing: 2 in. O.D. x 0.065 in. wall 2S, 40c. (½H); 52S, 61c. (O); 24S, 67½c. (T).

Plate: 0.250 in. and heavier: 2S and 3S, 21.2c.; 52s, 24.2c.; 61S, 22.3c.; 24S, 24.2c.

Flat Sheet: 0.188 in. thickness: 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base for tubing; 30,000-lb. base for plate, flat stock.

Extruded Shapes: "As extruded" temper; 2000-lb. base, 2S and 3S, factor No. 1 to 4, 25.5c.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 23c.; 61S, factor No. 1 to 4, 28½c.

The factor is determined by dividing perimeter of shape by weight per lineal foot.

Wire Rod and Bar: Base price; 17ST and 11ST-3, screw machine stock. Rounds: ¼ in., 28½c. per lb.; ½ in., 26c.; 1 in., 24½c.; 2 in., 23c. Hexagonals: ¼ in., 34½c. per lb.; ½ in., 28½c.; 1 in., 25½c.; 2 in., 25½c. 2S, as fabricated, random or standard lengths, ¼ in., 34c. per lb.; ½ in., 25c.; 1 in., 24c.; 2 in., 23c. 24ST, rectangles and squares, random or standard lengths. 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27½c.

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c.

NONFERROUS SCRAP METAL QUOTATIONS

†*(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)*

Copper, Copper Base Alloys

OPA Group 1†

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
No. 2 copper borings	8.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	5.10*

OPA Group 2†

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Contaminated gilded metal solids	8.00
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.25
Automobile radiators	7.00
Zincy bronze borings	8.00
Zincy bronze solids	8.00

OPA Group 3†

Fired rifle shells	8.25
Brass pipe	7.50
Old rolled brass	7.00
Admiralty condenser tubes	7.50
Muntz metal condenser tubes	7.00
Plated brass sheet, pipe reflectors	6.50
Manganese bronze solids	7.25[1]
Manganese bronze solids	6.25[2]
Manganese bronze borings	6.50[1]

OPA Group 4†

Refinery brass	4.75*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 per cent. [2] Lead content 0.41 to 1.00 per cent.

Other Copper Alloys

Briquetted Cartridge Brass Turnings	8.62½
Cartridge Brass Turnings, Loose	7.87½
Loose Yellow Brass Trimmings	7.87½

Aluminum

Plant scrap, segregated

2S solids	8.00
Dural alloys, solids 14, 17, 18, 24S	4.50
25S turnings, dry basis	3.00
Low copper alloys 51, 52, 61, 63S solids	7.50
turnings, dry basis	5.75

Plant scrap, mixed

Solids	4.00
Turnings, dry basis	2.75

Obsolete scrap

Pure cable	8.00
Old sheet and utensils	6.00
Old castings and forgings	5.00
Pistons, free of struts	5.00
Pistons, with struts	3.00
Old alloy sheet	5.00

Magnesium*

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	1.50

Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc

New zinc clippings, trimmings	6.50
Engravers, lithographers plates	6.50
Old zinc scrap	4.75
Unsweated zinc dross	5.00
Die cast slab	4.50
New die cast scrap	4.45
Radiator grilles, old and new	3.50
Old die cast scrap	3.00

Lead

Deduct 0.55c. a lb. from refined metal basing point prices or soft and hard lead including cable, for f.o.b. point of shipment price.

Nickel

Ni content 98+%, Cu under ½%, 26c. per lb.; 90 to 98% Ni, 26c. per lb contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb., f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	25⅛
Electrodeposited	18⅞
Rolled, oval, straight	19⅛
Curved	20¾
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	23⅛
Zinc, cast, 99.99, 15 in. or longer	16¼
Nickel, 99 per cent plus, frt. allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 1-9 troy oz., per oz.	58*

Chemicals

(Cents per lb., f.o.b. shipping point)

Copper cyanide, 1-5 bbls.	34.00
Copper sulphate, 99.5, crystals, bbls.	7.75
Nickel salts, single, 425 lb. bbls., frt. allowed	13.50
Silver cyanide, 100 oz. lots	—.4179
Sodium cyanide, 96 per cent, domestic, 100 lb. drums	15.00
Zinc cyanide, 100 lb. drums	33.00
Zinc sulphate, 89 per cent, crystals, bbls., frt. allowed	6.35

*Price based on use of foreign silver.

SCRAP

. . . News and Market Activities

Market Strong; Scrap Moving Well

New York

• • • With open hearth reaching ceiling in Philadelphia this week, this grade is selling at ceilings throughout the country except on the West Coast. Blast furnace grades have appreciated in practically every district market. The tone of the market is firm with dealers and brokers seemingly confident about future developments regardless of the approaching cutbacks.

The strengthening trend in the market is largely attributed to low mill inventories coupled with a shortage of blast furnace production.

For additional scrap news see p. 111.

Stocks of iron and steel scrap at plants of consumers, suppliers and producers increased slightly in April to 4,907,000 gross tons at the end of the month. This reflects an increase of 70,000 tons in purchased scrap and a decrease of 36,000 tons of home scrap. Stocks of pig iron totaled 1,153,000 tons at the end of April—a drop of 64,000 tons since last month. Meanwhile, consumption of scrap and pig iron dropped during the month to 2,096,000 tons of purchased scrap, 2,572,000 tons of home scrap, and 4,270,000 tons of pig iron. Total consumption of these products amounted to nearly nine million tons in April, a decrease of 6 per cent from March consumption.

•

Requests Investigation Of Foreign Scrap Sales

Washington

• • • The appointment of a seven-man congressional committee to investigate the sale of scrap iron and Maritime Commission merchant ships by the United States to Japan in the 10-year period prior to Pearl Harbor has been asked in a resolution introduced by Representative J. Parnell Thomas, Republican of New Jersey.

The resolution also requests that the committee investigate sales of scrap iron and ships to domestic or foreign agents who in turn resold to Japan and report its findings to the Congress with recommendations for any necessary legislation.

Mr. Thomas told THE IRON AGE that the proposed investigation would not be a witch-hunt but would be designed to set up a policy which would not permit the arming of nations so as to jeopardize world peace.

•

PITTSBURGH—A sudden strengthening of the short shoveling turnings and cast iron borings market moved the price back up to near-ceiling. Some dealers sold this week at ceiling without springboard or commission on these items, while others reported sales at 50c. under ceiling. All other grades are strong at the reported prices. Machine shop turnings, while there has been no price advance, are reported strong at the $12.00 to $12.50 level and some observers expect a price advance within a week or two. Re-entry of any large consumer into the machine shop turnings market will likely be the lever for an advance in price. The alloy free, long and short machine shop turnings for crushers continue selling in the $13.00 to $13.50 range. Further, shell contract cutbacks in this area this past week will likely shorten the supply of turnings and low phos by late July.

•

CHICAGO—Shortage of hot metal at principal consumers' plants, coupled with decreased turnings production due to shell cutbacks is exerting strong upward pressure. Buying is general and for the first time in several weeks long delivery periods extending up to 60 days are specified. One large consumer is reported paying springboard on bundled machine shop turnings as well as heavy melting steel. Alloy free short shoveling turnings have been sold at $14.50 and alloy free crushed shell turnings at $16.25 delivered to consumer both in comparatively small tonnages. Allocations, where possible, are more prevalent and permission to use electric furnace grades for open hearth melting is reported to have been given in one instance.

•

DETROIT — Firming tendencies were noted in the scrap market this week as bids were being prepared for automotive lists whose tonnages were generally better than expected. Turnings grades showed strength for blast furnace and open hearth account, and substantial demand continued for heavier material for the open hearths. Some sources figured the market condition was better than it had been for a couple of months.

•

BUFFALO—Return to the market this week of the second big consumer served to remove any lingering doubts regarding the near term outlook for open hearth scrap. Although no commission was allowed on this business, ceiling prices were paid for steel making grades and furthermore the buyer assumed the transportation tax. Light industrial scrap is in better balance, partly because of lessening supplies following cutbacks and prices are unchanged. Foundry grades are strong although scattered shutdowns for vacations have resulted in some shipments being held up temporarily.

CLEVELAND — Although some small tonnages have been bought in the last week, scrap is not moving any too fast. The market is stable, with blast furnace very strong and short turnings in considerable demand. Production of scrap has been falling off, because of the cutbacks and cancellations, and this surplus is being rapidly picked up. More than ever, mills are keeping their inventories down to the low limit.

•

BOSTON—Heavier material movement is moderate, particularly from ship and Navy yards, at ceiling prices. There is a better feeling in machine shop turnings. On direct yard shipments they are $6 a ton; through brokers $6.50. With vacations starting, fewer turnings will be made the next two months. Foundries are still hungry for cast and stove plate. Old chemical borings contracts are about completed. A few new ones have been made at ceilings.

•

PHILADELPHIA—Open hearth grades returned to ceiling price this week and other grades have experienced an upward trend. Although buying has increased somewhat, tonnages involved have not been very large. However, most orders are still on paper since shipments have been low. It is expected that the increase in prices will facilitate the flow of scrap from northern New Jersey and New York. Machine shop turnings have increased to $11.00 to $11.50 per gross ton. Heavy turnings are $17.50 to $18.00 this week and low phos plate and punchings are back to ceiling at $21.25. The demand for cast is still strong.

•

NEW YORK—Movement of scrap continues satisfactory in this district accompanied by increases in prices of turnings. All other grades continue to sell at ceiling prices. Mills seems to be in need of scrap despite early cutbacks and dealers believe this may be due to a combination of low inventory and the closing down of some blast furnace production.

•

ST. LOUIS—Shortage of labor to process the material continues to shorten the supply of scrap iron available to mills in the St. Louis industrial district. While the mills have ample inventories now, there is some concern over the future as during the hot weather of July and August there is always a slowing down of the movement. Borings and turnings are in greater demand from outside sources.

•

BIRMINGHAM—Practically no orders are being placed currently for open hearth grades in this market. Tonnages being accepted by mills are mostly carryovers from May. Blast furnace material continues to move under ceiling prices but foundry and electric furnace grades are very slow.

•

CINCINNATI—Virtually no new contracts are reported in this district and consumers and dealers are taking a very conservative attitude toward the market.

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages (for ceiling prices see O. P. A. schedule No. 4). Where ceiling prices are quoted they do not include brokerage fee or adjusted transportation charges. Asterisks indicate grades selling at ceilings.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bdld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	$12.00 to 12.50
Short shov. turn.	16.50 to 17.00
Mixed bor. and turn.	12.00 to 12.50
Cast iron borings	15.50 to 16.00
Hvy. break. cast	19.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bil. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	$12.00 to 12.50
Short shovel. turn.	13.50 to 14.00
Cast iron borings	12.50 to 13.00
Mix. borings & turn.	12.50 to 13.00
Low phos. hvy. forge	25.00*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Rails 3 ft. and under	22.25*
Locomotive tires, cut	22.50 to 23.00
Cut bolsters & side frames	19.75 to 20.25
Angles & Splice bars	22.25*
Standard stl. car axles	23.50 to 24.00
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast	20.00*
No. 1 agricul. cast	20.00*
Hvy. breakable cast	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast	20.00*
Cast iron carwheels	20.00*

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	$7.00 to 7.50
Shoveling turn.	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Mixed bor. & turn.	7.00 to 7.50
Low phos. plate	22.00*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Stove plate	19.00*
Scrap rails	21.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$15.05*
No. 2 hvy. melting	15.05*
No. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovelings	10.00 to 10.50
Machine shop turn.	6.00 to 6.50
Mixed bor. & turn.	6.00 to 6.50
Cl'n cast, chem. bor.	$13.06 to 14.15*

Truck delivery to foundry

Machinery cast	21.00 to 23.51*
Breakable cast	21.57 to 21.87*
Stove plate	20.00 to 23.51*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	$7.25 to 7.75
Short shov. turn.	11.00 to 11.50
Cast iron borings	11.25 to 11.75
Mixed bor. & turn.	7.25 to 7.75
Low phos. plate	19.00 to 19.82
No. 1 cupola cast	20.00*
Charging box cast	18.00 to 19.00
Hvy. breakable cast	16.50*
Stove plate	18.50 to 19.00
Automotive cast	20.00*

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	11.00 to 11.50
Shoveling turn.	12.00 to 12.50
Cast iron borings	12.00 to 12.50
Mixed bor. & turn.	11.00 to 11.50
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Cast, charging box	19.00*
Hvy. axle, forge turn.	17.50 to 18.00
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	$17.50*
Bundled sheets	17.50*
Mach. shop turn.	8.00 to 8.50
Hvy. axle turn.	10.00
Locomotive tires, uncut	17.00
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft. and under	21.50*
RR. springs	22.00*
Steel car axles	23.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 mach'ery cast	20.00*
Breakable cast	16.50*

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	$9.50 to 10.00
Cast iron borings	9.50 to 10.00
Bar crops and plate	19.50*
Structural and plate	19.50*
No. 1 cast	20.00*
Stove plate	17.00
Steel axles	18.00*
Scrap rails	18.50
Rerolling rails	20.50*
Angles & splice bars	20.50*
Rails 3 ft. & under	21.00*
Cast iron carwheels	16.50 to 17.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	$11.50 to 12.00
Short shovel. turn.	15.00 to 15.50
Cast iron borings	14.00 to 14.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	7.50
Mixed bor. & turn.	7.50
Shoveling turn.	10.00
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Charging box cast	19.00*
Stove plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	11.00
Shoveling turn.	14.00
Cast iron borings	12.00
Mixed bor. & turn.	11.00
No. 1 cupola cast	20.00*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00*
No. 2 bundles	19.50*
Mach. shop turn.	$10.00 to 10.50
Short shovel.	14.50 to 15.00
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	13.50 to 14.00
Mixed bor. & turn.	12.50 to 13.00
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	$16.50
No. 1 hvy. melting	16.50
No. 2 hvy. melting	15.00
No. 2 bales	$13.50 to 14.25
No. 3 bales	9.50 to 10.59
Mach. shop turn.	7.00
Elec. furn. 1 ft., und.	15.50 to 17.00
No. 1 cupola cast	19.00 to 21.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$14.50 to $15.50
No. 2 hvy. melting	13.50 to 14.50
No. 2 bales	12.50 to 13.50
No. 3 bales	9.00 to 10.00
Mach. shop turn.	4.50
No. 1 cupola cast	19.00 to 21.00

SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	$14.50
No. 1 hvy. melting	14.50*
No. 3 bundles	11.50
Elec. furn. 1 ft., und.	17.00
No. 1 cupola cast	20.00*

Comparison of Prices . .

Advances Over Past Week in **Heavy Type**; Declines in *Italics*. Prices are F.O.B. Major Basing Points. The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 148-157.

Flat Rolled Steel (Cents Per Lb.)	June 26, 1945	June 19, 1945	May 22, 1945	June 27, 1944
Hot rolled sheets	2.20	2.20	2.20	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.70	3.70	3.65	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.25	2.25	2.20	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.25	2.25	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40
Wire and Wire Products: (Cents Per Lb.)				
Bright wire	2.75	2.75	2.60	2.60
Wire nails	2.90	2.90	2.80	2.55
Rails: (Dollars Per Gross Ton)				
Heavy rails	$43.00	$43.00	$43.00	$40.00
Light rails	45.00	45.00	43.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	$36.00	$36.00	$34.00	$34.00
Sheet bars	36.00	36.00	34.00	34.00
Slabs, rerolling	36.00	36.00	34.00	34.00
Forging billets	42.00	42.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.15	2.15	2.00	2.00
Skelp	1.90	1.90	1.90	1.90

Latest steel price increase, Amendment 13 to RPS6, effective May 23, 1945.

Pig Iron: (Per Gross Ton)	June 26, 1945	June 19, 1945	May 22, 1945	June 27, 1944
No. 2 fdy., Philadelphia	$26.84	$26.84	$26.84	$25.84
No. 2, Valley furnace	25.00	25.00	25.00	24.00
No. 2, Southern, Cin'ti	26.11	26.11	26.11	25.11
No. 2, Birmingham	21.38	21.38	21.38	20.38
No. 2, foundry, Chicago†	25.00	25.00	25.00	24.00
Basic, del'd eastern Pa.	26.34	26.34	26.34	25.34
Basic, Valley furnace	24.50	24.50	24.50	23.50
Malleable, Chicago†	25.00	25.00	25.00	24.00
Malleable, Valley	25.00	25.00	25.00	24.00
L. S. charcoal, Chicago*	42.34	42.34	42.34	37.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

‡ For carlots at seaboard.

Last pig iron price change authorized by OPA effective Feb. 14, 1945.

* Charcoal price increase retroactive to March 7, on contracts to Feb. 13.

Scrap: (Per Gross Ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.25	18.00	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 east, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt	$7.50	$7.00	$7.00	$7.00
Foundry coke, prompt	9.00	8.25	8.25	8.25
Non-Ferrous Metals: (Cents Per Lb. to Large Buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Composite Prices . .

Starting with the issue of April 22, 1943, the weighted finished steel price index was revised for the years 1941, 1942 and 1943. See explanation of the change on page 90 of the April 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
June 26, 1945	2.41571c. a Lb.	$24.61 a Gross Ton	$19.17 a Gross Ton
One week ago	2.41571c. a Lb.	$24.61 a Gross Ton	$19.00 a Gross Ton
One month ago	2.38444c. a Lb.	$24.61 a Gross Ton	$18.92 a Gross Ton
One year ago	2.30329c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1945	2.41571c., May 29	2.21189c., Jan. 2	$24.61, Feb. 20	$23.61, Jan. 2	$19.17	$19.17
1944	2.30837c., Sept. 5	2.21189c., Oct. 5	$23.61	$23.61	19.17	$15.67, Oct. 24
1943	2.25513c.	2.25513c.	23.61	23.61	19.17	19.17
1942	2.26190c.	2.26190c.	23.61	23.61	19.17	19.17
1941	2.43078c.	2.43078c.	$23.61, Mar. 20	$23.45, Jan. 2	$22.00, Jan. 7	$19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.67, June 8
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c. Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.99626c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Prices of Finished Iron and Steel . . .

Steel prices shown here are f.o.b. basing points, in cents per lb. unless otherwise indicated. Extras apply. Delivered prices do not reflect 3% tax on freight. (1) Mill run sheet, 10c. per 100 lb. under base; primes, 25c. above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25c. per 100 lb. to fabricators. (8) Also shafting. For quantities of 20,000 to 29,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (12) Boxed. (14) This base price for annealed, bright finish wires, commercial spring wire. (15) Produced to dimensional tolerances in AISI Manual Sect. 6. For price exceptions to finished and semi-finished steels turn two pages.

Basing Point / Product	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	10 Pacific Ports, Cars	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.30¢	2.20¢		2.75¢	2.30¢	2.44¢	2.37¢
Cold rolled [1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 gage)	3.70¢	3.70¢	3.70¢		3.70¢	3.70¢	3.70¢	3.70¢	3.80¢	3.70¢		4.25¢		3.94¢	3.87¢
Enameling (20 gage)	3.45¢	3.45¢	3.45¢	3.45¢			3.45¢		3.55¢	3.45¢		4.10¢	3.55¢	3.81¢	3.77¢
Long ternes [3]	3.80¢	3.80¢	3.80¢									4.55¢		4 16¢	4.12¢
STRIP															
Hot rolled [3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled [4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester=3.00¢)					2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢	3.05¢		2.95¢			2.95¢	(Worcester=3.35¢)					3.05¢	3 31¢	
TIN PLATE															
Standard cokes, base box	$5.00	$5.00	$5.00						$5.10					5.36¢	5.32¢
Electro, box {0.25 lb. / 0.50 lb. / 0.75 lb.}	$4.35 / $4.50 / $4.65	$4.35 / $4.50	$4.35 / $4.50 / $4.65						$4.60 / $4 75						
BLACK PLATE 29 gage [5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢[12]			3.37¢
TERNES, MFG. Special coated, base box	$4.30	$4.30	$4.30						$4 40						
BARS															
Carbon steel	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢		(Duluth=2.35¢)			2.60¢	2.90¢	2.35¢	2.59¢	2.57¢
Rail steel [6]	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢					2.60¢	2.90¢			
Reinforcing (billet) [7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.39¢	
Reinforcing (rail) [7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢	2.25¢		2.47¢
Cold finished [8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit=2.70¢)			(Toledo=2.80¢)		2.99¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢		(Bethlehem, Massillon, Canton=2.70¢)					2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3 35¢	3.35¢		3.35¢							3 45¢		
PLATES								(Coatesville and Claymont=2.25¢)							
Carbon steel [15]	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢		2.25¢	2.25¢	2 50¢		2.60¢	2.80¢	2.47¢	2.44¢	2.30¢
Floor plates	3.50¢	3.50¢									3.85¢	4.15¢		3.86¢	3.82¢
Alloy	3.50¢	3.50¢			(Coatesville=3.50¢)						3.95¢	4.15¢		3 70¢	3 59¢
SHAPES Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem=2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester=3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester=4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester=6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8 35¢			(Worcester=8.55¢)								
WIRE [9]															
Bright [14]	2.75¢	2.75¢		2.75¢	2.75¢		(Worcester=2.85¢)			(Duluth=2.80¢)		3.25¢			3.07¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire base														
Spring (High Carbon)	3.35¢	3.35¢		3.35¢			(Worcester=3.45¢)					3.85¢			3.67¢
PILING Steel Sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢

SEMI-FINISHED STEEL

Ingots, Carbon, Rerolling

Base per gross ton, f.o.b. mill.... $31.00

Ingots, Carbon, Forging

Base per gross ton, f.o.b. Birmingham, Buffalo, Chicago, Cleveland, Gary, Pittsburgh, Youngstown $36.00

Ingots, Alloy

Base per gross ton, f.o.b. Bethlehem, Buffalo, Canton, Coatesville, Chicago, Massillon, Pittsburgh $45.00

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.00 higher; delivered E. Michigan, $3 higher; f.o.b. Duluth, billets only, $2.00 higher; billets f.o.b. Pacific ports are $12 higher. Provo, $11.20 higher. Delivered prices do not reflect three per cent tax on freight rates.

Per Gross Ton

Rerolling $36.00
Forging quality 42.00

Alloy Billets, Blooms, Slabs

Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem, per gross ton $54.00

Price delivered Detroit $2.00 higher; East Michigan, $3.00 higher.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point.

Per Gross Ton

Open hearth or bessemer $36.00

PRICES

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.15c.
Worcester, Mass.	2.25c.
Birmingham	2.15c.
San Francisco	2.65c.
Galveston	2.40c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

Shell Steel

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.00 higher; East Michigan, $3 higher.

Price Exceptions: Follansbee Steel Corp. permitted to sell at $13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of $52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., No. 1 O.H., gross ton	$43.00
Angle splice bars, 100 lb.	2.70
(F.o.b. Basing Points)	*Per Gross Ton*
Light rails (from billets)	$45.00
Light rails (from rail steel)	44.00
	Base per Lb.
Cut spikes	3.25c.
Screw spikes	5.40c.
Tie plate, steel	2.30c.
Tie plates, Pacific Coast	2.45c.
Track bolts	4.75c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25c.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi 3c. higher.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	*Pacific Coast Basing Points†*
	Base per Keg	
Standard wire nails	$2.90	$3.40
Coated nails	2.90	3.40
Cut nails, carloads	3.85	....
	Base per 100 Lb.	
Annealed fence wire	$3.05	$3.55
Annealed galv. fence wire	3.40	3.90
	Base Column	
Woven wire fence*	67	85
Fence posts, carloads	69	86
Single loop bale ties	66	91
Galvanized barbed wire**	72	82
Twisted barbless wire	72	....

*15½ gage and heavier. **On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb. These are zoned warehouse prices in conformance with latest zoning amendment to OPA Price Schedule 49.

Cities	SHEETS			STRIP		Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled, NE 8617-20	Hot Rolled, NE 9442-45 Ann.	Cold Drawn, NE 8617-20	Cold Drawn, NE 9442-45 Ann.
**Philadelphia	$3.518	$4.872[6]	$5.158a	$3.922	$4.772	$3.605	$3.666	$3.822	$4.072	$5.966	$7.066	$7.272	$8.322
New York	3.59	4.613[3]	5.110	3.974[6]	4.772	3.768	3.758	3.853	4.103	5.858	6.908	7.103	8.203
Boston	3.744	4.744[9]	5.224[9]	4.108	4.718	3.912	3.912	4.044	4.144	6.162	7.262	7.344	8.394
Baltimore	3.394	4.852	4.894	3.902	4.752	3.594	3.759	3.902	4.052	....	....	....	....
Norfolk	3.771	4.965	5.371	4.185	4.865	3.971	4.002	4.065	4.165	....	....	....	....
Chicago	3.25	4.20	5.231	3.60	4.65[17]	3.55	3.55	3.50	3.75	5.75	6.85	6.85	7.90
Milwaukee	3.387	4.337[3]	5.272[4]	3.737	4.787[17]	3.687	3.687	3.637	3.887	5.987	7.087	7.087	8.137
Cleveland	3.35	4.40	4.877[4]	3.60	4.45	3.40	3.588	3.35	3.75	5.956	7.056	6.85	7.90
Buffalo	3.36	4.40	4.754	3.819	4.669	3.63	3.40	3.25	3.75	5.75	6.85	6.85	7.90
Detroit	3.45	4.50	5.004	3.70	4.869[17]	3.609	3.661	3.45	3.80	6.08	7.18	7.189	8.208
Cincinnati	3.425	4.475[3]	4.825[5]	3.675	4.711	3.611	3.691	3.811	4.011	....	....	....	....
St. Louis	3.397	4.347[3]	5.172[4]	3.747	4.831[17]	3.697	3.697	3.647	4.031	6.131	7.231	7.231	8.281
Pittsburgh	3.35	4.40	4.75	3.60	4.45	3.40	3.40	3.35	3.75	5.75	6.85	6.85	7.90
St. Paul	3.51	4.48	5.257[4]	3.86	4.351[7]	3.811[3]	3.811[3]	3.761[3]	4.361	6.09	7.19	7.561	8.711
Omaha	3.865	5.443	5.608[4]	4.215	....	4.165	4.165	4.115	4.43	....	....	....	....
Indianapolis	3.518	4.568	4.548	3.768	4.741	3.63	3.63	3.58	3.98	6.08	7.18	7.18	8.23
Birmingham	3.45	....	4.75	3.70	....	3.55	3.55	3.50	4.43	....	....	....	....
Memphis	3.965[7]	4.86	3.265	4.215	....	4.065	4.065	4.015	4.33	....	....	....	....
New Orleans	4.058[a]	4.95	5.358	4.308	....	4.158	4.158[a]	4.108[a]	4.829	....	....	....	....
Houston	3.763	5.573	6.313[1]	4.313	....	4.25	4.25	3.75	6.373[3]	7.223	8.323	8.323	9.373
Los Angeles	4.10	7.20[3]	6.10[4]	4.95	5.813[15]	4.95	4.85	4.40	5.583	9.304	9.404	9.404	10.454
San Francisco	4.55[14]	7.30[4]	6.354	4.50[14]	7.333[17]	4.65[14]	4.35[14]	4.15[14]	5.333	9.304	9.404	9.404	10.454
Seattle	4.65[12]	7.05[4]	5.954	4.25[12]	....	4.75[12]	4.45[12]	4.35[12]	5.783	....	9.404	....	....
Portland	4.65[11]	6.80[4]	5.754	4.75[11]	....	4.85[11]	4.45[11]	4.45[11]	5.833	9.304	9.404	9.304	9.404
Salt Lake City	4.530[17]	....	6.171[3]	5.53[17]	....	4.98[17]	4.98[17]	4.88[17]	5.90	....	....	....	....

National Emergency Steels

MILL EXTRAS

Designation	Basic Open-Hearth		Electric Furnace		Designation	Basic Open-Hearth		Electric Furnace	
	Bars and Bar-Strip	Billets, Blooms, and Slabs	Bars and Bar-Strip	Billets, Blooms, and Slabs		Bars and Bar-Strip	Billets, Blooms, and Slabs	Bars and Bar-Strip	Billets, Blooms, and Slabs
NE 8612	0.65¢	$13.00	$1.15	$23.00	NE 9427	0.75¢	$15.00	$1.25	$25.00
NE 8615	0.65	13.00	1.15	23.00	NE 9430	0.75	15.00	1.25	25.00
NE 8617	0.65	13.00	1.15	23.00	NE 9432	0.75	15.00	1.25	25.00
NE 8620	0.65	13.00	1.15	23.00	NE 9435	0.75	15.00	1.25	25.00
NE 8622	0.65	13.00	1.15	23.00	NE 9437	0.75	15.00	1.25	25.00
NE 8625	0.65	13.00	1.15	23.00	NE 9440	0.75	15.00	1.25	25.00
NE 8627	0.65	13.00	1.15	23.00	NE 9442	0.80	16.00	1.30	26.00
NE 8630	0.65	13.00	1.15	23.00	NE 9445	0.80	16.00	1.30	26.00
NE 8632	0.65	13.00	1.15	23.00	NE 9447	0.80	16.00	1.30	26.00
NE 8635	0.65	13.00	1.15	23.00	NE 9450	0.80	16.00	1.30	26.00
NE 8637	0.65	13.00	1.15	23.00					
NE 8640	0.65	13.00	1.15	23.00					
NE 8642	0.65	13.00	1.15	23.00	NE 9722	0.65	13.00	1.15	23.00
NE 8645	0.65	13.00	1.15	23.00	NE 9727	0.65	13.00	1.15	23.00
NE 8647	0.65	13.00	1.15	23.00	NE 9732	0.65	13.00	1.15	23.00
NE 8650	0.65	13.00	1.15	23.00	NE 9737	0.65	13.00	1.15	23.00
					NE 9742	0.65	13.00	1.15	23.00
					NE 9745	0.65	13.00	1.15	23.00
NE 8712	0.70	14.00	1.20	24.00	NE 9747	0.65	13.00	1.15	23.00
NE 8715	0.70	14.00	1.20	24.00	NE 9750	0.65	13.00	1.15	23.00
NE 8717	0.70	14.00	1.20	24.00	NE 9763	0.65	13.00	1.15	23.00
NE 8720	0.70	14.00	1.20	24.00	NE 9768	0.65	13.00	1.15	23.00
NE 8722	0.70	14.00	1.20	24.00					
NE 8725	0.70	14.00	1.20	24.00					
NE 8727	0.70	14.00	1.20	24.00	NE 9830	$1.30	26.00	1.80	36.00
NE 8730	0.70	14.00	1.20	24.00	NE 9832	1.30	26.00	1.80	36.00
NE 8732	0.70	14.00	1.20	24.00	NE 9835	1.30	26.00	1.80	36.00
NE 8735	0.70	14.00	1.20	24.00	NE 9837	1.30	26.00	1.80	36.00
NE 8737	0.70	14.00	1.20	24.00	NE 9840	1.30	26.00	1.80	36.00
NE 8740	0.70	14.00	1.20	24.00	NE 9842	1.30	26.00	1.80	36.00
NE 8742	0.70	14.00	1.20	24.00	NE 9845	1.30	26.00	1.80	36.00
NE 8745	0.70	14.00	1.20	24.00	NE 9847	1.30	26.00	1.80	36.00
NE 8747	0.70	14.00	1.20	24.00	NE 9850	1.30	26.00	1.80	36.00
NE 8750	0.70	14.00	1.20	24.00					
					NE 9912	1.20	24.00	1.55	31.00
NE 9415	0.75	15.00	1.25	25.00	NE 9915	1.20	24.00	1.55	31.00
NE 9417	0.75	15.00	1.25	25.00	NE 9917	1.20	24.00	1.55	31.00
NE 9420	0.75	15.00	1.25	25.00	NE 9920	1.20	24.00	1.55	31.00
NE 9422	0.75	15.00	1.25	25.00	NE 9922	1.20	24.00	1.55	31.00
NE 9425	0.75	15.00	1.25	25.00	NE 9925	1.20	24.00	1.55	31.00

Note 1: The ranges shown are restricted to sizes 100 sq. in. or less or equivalent cross-sectional area 18 in. wide or under, with a maximum individual piece weight of 7000 lb. irrespective of size. **Note 2:** For steels ordered to such ranges, below the size and weight restriction, the average of all the chemical checks must be within the limits specified subject to check analysis variations given in Table 4, Section 10, AISI Steel Products Manual. **Note 3:** When acid open-hearth is specified and acceptable, add to basic open-hearth alloy differential 0.25c. per lb. for bars and bar strip and $5 per gross ton for billets, blooms and slabs. **Note 4:** The extras shown are in addition to the base price of $2.70 for 100 lb. on finished products and $54 per gross ton on semi-finished steel, major basing points, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. The full extra applicable over the base price is the total of all extras indicated by the specific requirements of the order. The higher extra shall be charged for any size falling between two published extras.

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD ROLLED: Sheets, 400 to 1499 lb.; strip, extras on all quantities; bars, 1500 lb. base; NE alloy bars, 1000 to 39,999 lb.

EXCEPTIONS: (1) 150 to 499 lb. (2) 150 to 1499 lb. (3) 400 to 1499 lb. (4) 450 to 1499 lb. (5) 500 to 1499 lb. (6) 0 to 199 lb. (7) 400 to 1499 lb. (8) 1000 to 1999 lb. (9) 450 to 3749 lb. (10) 400 to 3999 lb. (11) 300 to 4999 lb. (12) 300 to 10,000 lb. (13) 400 to 14,999 lb. (14) 400 lb. and over. (15) 1000 lb. and over. (16) 1500 lb. and over. (17) 2000 lb. and over. (18) 3500 lb. and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

*Add 0.27¢c. for sizes not rolled in Birmingham.

**City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports**)

	Per Gross Ton
Old range, bessemer, 51.50	$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50	4.60
Mesaba, non-bessemer, 51.50	4.45
High phosphorus, 51.50	4.35

*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Exception

When the WPB Steel Division certifies in writing the consumer's need for one of the higher grades of metallurgical fluorspar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	$0.00

PRICES

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)
Base Price—$200.00 per Net Ton

Steel (Butt Weld)

	Black	Galv
⅛ in.	63½	51
¼ in.	66½	55
⅜ to 3 in.	68½	57½

Wrought Iron (Butt Weld)

⅛ in.	24	3½
¼ in.	30	10
⅜ and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18

Steel (Lap Weld)

2 in.	61	49½
2½ in. and 3 in.	64	52½
3½ to 6 in.	66	54½

Wrought Iron (Lap Weld)

2 in.	30½	13
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17

Steel (Butt, extra strong, plain ends)

⅛ in.	61½	50½
¼ in.	65½	54½
⅜ to 3 in.	67	57

Wrought Iron (Same as Above)

⅛ in.	25	6
¼ in.	31	12
⅜ to 2 in.	38	19½

Steel (Lap, extra strong, plain ends)

2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56

Wrought Iron (Same as Above)

2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld.

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	53.20
6 in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger are $45 at Birmingham and $53.80 delivered Chicago, $59.40 at San Francisco and Los Angeles, and $70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall. Net base prices per 100 ft. f.o.b. Pitsburgh, in carload lots.

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld, Hot Rolled
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft. and over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

PRICES

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 3[illegible]
Forging billets	21.25c.	20.4[illegible]c.
Bars	25.00c.	24.0[illegible]c.
Plates	29.00c.	27.0[illegible]c.
Structural shapes	25.00c.	24.0[illegible]c.
Sheets	36.00c.	34.0[illegible]c.
Hot rolled strip	23.50c.	21.5[illegible]c.
Cold rolled strip	30.00c.	28.0[illegible]c.
Drawn wire	25.00c.	24.0[illegible]c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 44[illegible]
F.Billets	15.725c.	16.15c.	19.125c.	23.37[illegible]c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hot strip	17.00c.	17.50c.	24.00c.	35.00c.
Cold strip	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 30[illegible]
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Per 1000
Super-duty brick, St. Louis	$66.[illegible]
First quality, Pa., Md., Ky., Mo., Ill.	52.[illegible]
First quality, New Jersey	57.[illegible]
Sec. quality, Pa., Md., Ky., Mo., Ill.	47.[illegible]
Sec. quality, New Jersey	52.[illegible]
No. 1 Ohio	44.[illegible]
Ground fire clay, net ton	7.[illegible]

Silica Brick

Pennsylvania and Birmingham	$52.[illegible]
Chicago District	60.[illegible]
Silica cement, net ton (Eastern)	9.[illegible]

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$54.[illegible]

Magnesite Brick

Standard, Balt. and Chester	$76.[illegible]
Chemically bonded, Baltimore	65.[illegible]

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$43.[illegible]
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.[illegible]

EXCEPTIONS TO RPS 6

Ingots, carbon, rerolling—Phoenix Iron Co. may charge $38.75; Kaiser Co. $43.00 f.o.b. Pacific Coast ports; Empire Sheet & Tinplate Co., $34.25; Pgh. Steel Co., $33.10.

Ingots, carbon, forging—Phoenix Iron Co. may charge $43.00; Empire Sheet & Tinplate Co., $39.25, f.o.b. Mansfield, Ohio; West Coast producers, $48.00, f.o.b. Pacific Coast Ports; Pgh. Steel Co. $38.10.

Ingots, alloy—C/l delivered Detroit add $2.00; delivered East Michigan add $3.00. Connors Steel Co. may charge $45.00 f.o.b. Birmingham.

Slabs, per gross ton—Andrews Steel Co. $41 basing pts.; Wheeling Steel Corp. (rerolling) 4 in. sq. or larger $37.75 f.o.b. Portsmouth, Ohio; Empire Sheet & Tin Plate Corp. $41; Phoenix Iron Co. (rerolling) $41, (forging) $47; Granite City Steel $47.50; Kaiser Co., (rerolling) $58.64, (forging) $64.64, f.o.b. Los Angeles.

Blooms, per gross ton—Phoenix Iron Co. (rerolling) $41; (forging) $47; Pgh. Steel Co. (rerolling) $38.25, (forging) $44.25; Wheeling Steel Corp. (rerolling) 4 in. sq. or larger $37.75 f.o.b. Portsmouth; Kaiser Co. (rerolling) $58.64, (forging) $64.64 (shell steel) $74.64 f.o.b. Los Angeles.

Sheet Bar, per gross ton—Empire Sheet & Tinplate Co. $39 mill; Wheeling Steel Corp. $38 Portsmouth, Ohio.

Billets, Forging, per gross ton—Andrews Steel Co. $50 basing pts.; Follansbee Steel Corp. $49.50 Toronto, Ohio; Phoenix Iron Co. $47 mill; Geneva Steel Co. $64.64 f.o.b. Pacific Coast; Pittsburgh Steel Co. $49.50; Kaiser Co. $64.64, (shell steel) $74.64, f.o.b. Los Angeles.

PRICES

Billets, Rerolling, per gross ton—Continental Steel Corp. may charge Acme Steel in Chicago switching area $34 plus freight from Kokomo, Ind.; Northwestern Steel & Wire Co. (Lend-Lease) $41 mill; Wheeling Steel Corp. 4 in. sq. or larger $37.75, smaller $39.50 f.o.b. Portsmouth, Ohio; Stanley Works may sell Washburn Wire Co. under allocation at $39 Bridgeport, Conn.; Keystone Steel & Wire Co. may sell Acme Steel Co. at Chicago base, f.o.b. Peoria; Phoenix Iron Co. $41 mill; Continental Steel Corp. (1¾ x 1¾) $39.50, (2 x 2) $40.60 Kokomo, Ind. (these prices include $1 size extra); Keystone Steel & Wire Co. $36.40 Peoria; Connors Steel Co. $50.60 Birmingham; Ford Motor Co. $34 Dearborn, Mich.; Geneva Steel Co. $58.64 f.o.b. Pacific Coast; Pgh. Steel Co. $43.50; Kaiser Co. $58.64 f.o.b. Los Angeles.

Structural Shapes—Phoenix Iron Co. 2.35c. basing pts. (export) 2.50c. Phoenixville; Knoxville Iron Co. 2.30c. basing points; Kaiser Co. 3.20c. f.o.b. Los Angeles.

Rails, per gross ton—Sweet Steel Co. (rail steel) $50 mill; West Virginia Rail Co. (lightweight) on allocation based Huntington, W. Va.; Colorado Fuel & Iron, $45 Pueblo.

Hot Rolled Plate—Granite City Steel Co. 2.55c. mill; Knoxville Iron Co. 2.25c. basing pts.; Kaiser Co. and Geneva Steel Co. 3.20c. Pacific Ports; Central Iron and Steel Co. 2.50c. basing points; Granite City Steel Co. 2.35c. Granite City.

Merchant Bars—W. Ames Co., 10 tons and over, 2.85c. mill; Eckels-Nye Steel Corp. 2.50c. basing pts. (rail steel) 2.40c.; Phoenix Iron Co. 2.40c. basing pts.; Sweet Steel Co. (rail steel) 2.33c. mill; Joslyn Mfg. & Supply Co., 2.35c. Chicago; Calumet Steel Div., Borg Warner Corp. (8 in. mill bar), 2.35c. Chicago; Knoxville Iron Co., 2.30c. basing pts.; Laclede Steel Co., sales to LaSalle Steel granted Chicago base, f.ob Madison, Ill.; Milton Mfg. Co., 2.75c. f.o.b. Milton, Pa.

Pipe Skelp—Wheeling Steel, Benwood, 2.05c.

Reinforcing Bars—W. Ames & Co., 10 tons and over, 2.85c. mill; Sweet Steel Co. (rail steel), 2.33c. mill; Columbia Steel Co., 2.50c. Pacific Ports.

Cold Finished Bars—Keystone Drawn Steel Co. on allocation, Pittsburgh c.f. base plus c/l freight on hot rolled bars Pittsburgh to Spring City, Pa.; New England Drawn Steel Co. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to Mansfield, Mass., f.o.b. Mansfield; Empire Finished Steel Corp. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to plants, f.o.b. plant; Compressed Steel Shafting Co. on allocation outside New England, Buffalo base plus c/l freight Buffalo to Readville, Mass., f.o.b. Readville; Medart Co. in certain areas, Chicago c.f. base plus c/l freight Chicago to St. Louis, f.o.b. St. Louis.

Alloy Bars—Texas Steel Co., for delivery except Texas and Okla., Chicago base, f.o.b. Fort Worth, Tex.; Connors Steel Co., shipped outside Ala., Mississippi, Louisiana, Georgia, Florida, Tenn., Pittsburgh base, f.o.b. Birmingham.

Hot Rolled Strip—Joslyn Mfg. & Supply Co., 2.30c. Chicago; Knoxville Iron Co., 2.25c. basing pts.

Hot Rolled Sheets—Andrews Steel Co., Middletown base on shipments to Detroit or area; Parkersburg Iron & Steel, 2.25c. Parkersburg.

Galvanized Sheets—Andrews Steel Co. 3.75c. basing pts.; Parkersburg Iron & Steel Co., 3.85c. Parkersburg; Continental Steel Co., Middletown base on Kokomo, Ind., product; Superior Sheet Steel Co., Pittsburgh base except for Lend-Lease.

Pipe and Tubing—South Chester Tube Co. when priced at Pittsburgh, freight to Gulf Coast and Pacific Ports may be charged from Chester, Pa., also to points lying west of Harrisburg, Pa.

Black Sheets—Empire Sheet and Tinplate Co., maximum base price mill is 2.45c. per 100 lb., with differentials, transportation charges, etc., provided in RPS. No. 6.

Wire Products—Pittsburgh Steel Co., f.o.b. Pittsburgh, per 100 lb., rods, No. 5 to 9/32 in., 2.20c.; rods, heavier than 9/32, 2.35c.; bright wire, 2.725c.; bright nails, 2.90c.; lead and furnace annealed wire, 2.85c.; pot annealed wire, 2.85c.; galvanized barbed wire, 3.90c.; plain staples, 2.55c.; galvanized staples, 2.65c.; bright spring wire, 3.30c.; galvanized spring wire, 3.45c.

PIG IRON PRICES

BASING POINT* BASE PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	$25.50	$26.00	$26.50	$27.00	.....
Birdsboro	25.50	26.00	26.50	27.00	$30.50
Birmingham	20.00	21.38	.....	26.00	.....
Buffalo	24.00	25.00	25.50	26.00	30.50
Chicago	24.50	25.00	25.00	25.50	.....
Cleveland	24.50	25.00	25.00	25.50	.....
Detroit	24.50	25.00	25.00	25.50	.....
Duluth	25.00	25.50	25.50	26.00	.....
Erie	24.50	25.00	25.50	26.00	.....
Everett	25.50	26.00	26.50	27.00	.....
Granite City	24.50	25.00	25.00	25.50	.....
Hamilton	24.50	25.00	25.00	.....	.....
Neville Island	24.50	25.00	25.00	25.50	.....
Provo	22.50	23.00	.....	.....	.....
Sharpsville[1]	24.50	25.00	25.00	25.50	.....
Sparrows Point	25.50	26.00	.....	.....	.....
Steelton	25.50	.....	.....	.....	30.50
Swedeland	25.50	26.00	26.50	27.00	.....
Toledo	24.50	25.00	25.00	25.50	.....
Youngstown	24.50	25.00	25.00	25.50	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$ .50	$26.00	$26.50	$27.00	$27.50	.....
Boston	Birdsboro-Steelton	4.02	.....	.....	.....	.....	$34.52
Brooklyn	Bethlehem	2.50	28.00	28.50	29.00	29.50	.....
Brooklyn	Birdsboro	2.92	.....	.....	.....	.....	33.42
Canton	Cleveland	1.39	25.89	26.39	26.39	26.89	.....
Canton	Buffalo	3.19	.....	.....	.....	.....	33.69
Cincinnati	Birmingham	4.06	24.06	25.44	.....	.....	.....
Cincinnati	Hamilton	1.11	.....	.....	26.11	.....	.....
Cincinnati	Buffalo	4.40	.....	.....	.....	.....	34.90
Jersey City	Bethlehem	1.53	27.03	27.53	28.03	28.53	.....
Jersey City	Birdsboro	1.94	.....	.....	.....	.....	32.44
Los Angeles	Provo	4.95	27.45	27.95	.....	.....	.....
Los Angeles	Buffalo	15.41	.....	.....	.....	.....	45.91
Mansfield	Cleveland & Toledo	1.94	26.44	26.94	26.94	27.44	.....
Mansfield	Buffalo	3.36	.....	.....	.....	.....	33.86
Philadelphia	Swedeland	.84	26.34	26.84	27.34	27.84	.....
Philadelphia	Birdsboro	1.24	.....	.....	.....	.....	31.74
San Francisco	Provo	4.95	27.45	27.95	.....	.....	.....
San Francisco	Buffalo	15.41	.....	.....	.....	.....	45.91
Seattle	Provo	4.95	27.45	27.95	.....	.....	.....
Seattle	Buffalo	15.41	.....	.....	.....	.....	45.91
St. Louis	Granite City	.50	25.00	25.50	25.50	26.00	.....
St. Louis	Buffalo	7.07	.....	.....	.....	.....	37.57

* Maximum per gross ton, established by OPA February 14, 1945. † Prices do not reflect 3 per cent tax on freight.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, $33.00 and $34.00, respectively. Newberry Brand of Lake Superior charcoal iron $39.00 per g.t., f.o.b. furnace, by order L 39 to RPS 10, April 11, 1945, retroactive to March 7, 1945. Delivered to Chicago, $42.34. High phosphorus iron sells at Lyles, Tenn., at $28.50.

Basing point prices are subject to switching charges; Silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 to 2.25 per cent); Phosphorus differentials, a reduction of 38c. per ton for phosphorus content of 0.70 per cent and over; Manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and $1 per ton extra for each additional 0.25 per cent nickel.

Silvery iron and bessemer ferrosilicon up to and including 14.00 per cent silicon covered by RPS 10 as amended Feb. 14, 1945. Silvery iron, silicon 6.00 to 6.50 per cent, C/L per G.T., f.o.b. Jackon, Ohio—$30.50; f.o.b. Buffalo—$31.75. Add $1.00 per ton for each additional 0.50% Si. Add 50c. per ton for each 0.50% Mn over 1.00%. Add $1.00 per ton for 0.75% or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, c. per lb., ton lots.

Copper, electrolytic, 150 and 200 mesh	21½ to 23½c.
Copper, reduced, 150 and 200 mesh	20½ to 25½c.
Iron, commercial, 100 and 200 mesh 96 + % Fe	12½ to 15c.
Iron, crushed, 200 mesh and finer, 90 + % Fe, carload lots	4c.
Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe, drum lots	63c.
Iron, electrolytic, unannealed, 300 mesh and coarser, 99 + % Fe	30 to 33c.
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	42c.
Iron, carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90c.
Aluminum, 100 and 200 mesh	*23 to 27c.
Antimony, 100 mesh	20.6c.
Cadmium, 100 mesh	$1
Chromium, 150 mesh	$1.03
Lead, 100, 200 & 300 mesh	11½ to 12½c.
Manganese, 150 mesh	51c.
Nickel, 150 mesh	51½c.
Solder powder, 100 mesh	8½c. plus metal
Tin, 100 mesh	58¾c.
Tungsten metal powder, 98%-99%, any quantity, per lb.	$2.60
Molybdenum powder, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb.	$2.60
Under 100 lb.	$3.00

*Freight allowed east of Mississippi.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$7.50*
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.10
Connellsville, Pa.	9.00
Foundry, By-Product	
Chicago, del'd	13.35
Chicago, f.o.b.	12.60
New England, del'd	14.25
Kearny, N. J., f.o.b.	12.65
Philadelphia, del'd	12.88
Buffalo, del'd	13.00
Portsmouth, Ohio, f.o.b.	11.10
Painesville, Ohio, f.o.b.	11.75
Erie, del'd	12.75
Cleveland, del'd	12.80
Cincinnati, del'd	12.85
St. Louis, del'd	13.85
Birmingham, del'd	10.50

*Hand drawn ovens using trucked coal permitted to charge $8.00 per ton plus transportation charges.

PRICES

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

Base discount less case lots

	Per Cent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all lengths	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 in. through 1 in.	59	
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 per cent additional discount.

Stove Bolts	*Consumer*
Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets

(½ in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets

(7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws	*Consumer Per Cent Off List*
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.30c.
Armature	3.65c.
Electrical	4.15c.
Motor	5.05c.
Dynamo	5.75c.
Transformer 72	6.25c.
Transformer 65	7.25c.
Transformer 58	7.75c.
Transformer 52	8.55c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

PRICES

Ferromanganese

78-82% Mn, maximum contract base price per gross ton, lump size, f.o.b. car at Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Carload lots (packed)	141.00
Less ton lots (packed)	143.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Manganese Metal

Contract basis, lump size, per lb. of metal, f.o.b. shipping point with freight allowed. Spot sales add 2c. per lb.

96-98% Mn, .2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	36c.
L.c.l. lots	38c.

95-97% Mn, .2% max. C, 1.5% max. Si, 2.5% max. Fe.

Carload, bulk	34c.
L.c.l. lots	35c.

Spiegeleisen

Maximum base, contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50

Electric Ferrosilicon

OPA maximum base price cents per lb. contained Si, lump size in carloads, f.o.b. shipping point with freight allowed.

	Eastern Zone	Central Zone	Western Zone
50% Si	6.65c.	7.10c.	7.35c.
75% Si	8.05c.	8.20c.	8.75c.
80-90% Si.	8.90c.	9.05c.	9.55c.
90-95% Si.	11.05c.	11.20c.	11.65c.

Spot sales add: 45c. per lb. for 50% Si, .3c. per lb. for 75% Si, .25c. per lb. for 80-90% and 90-95% Si.

Silvery Iron

Silvery Iron, Silicon 14.01 to 14.50 per cent, $45.50 per G. T. f.o.b. Jackson, Ohio. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%. Covered by MPR 405.

Silicon Metal

OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination, for l.c.l. above 2000 lb., packed. Add .25c. for spot sales.

	Eastern Zone	Central Zone	Western Zone
96% Si, 2% Fe..	13.10c.	13.55c.	16.50c.
97% Si, 1% Fe..	13.45c.	13.90c.	16.80c.

Ferrosilicon Briquets

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% Si. Add .25c. for spot sales.

	Eastern Zone	Central Zone	Western Zone
Carload, bulk	3.35c.	3.50c.	3.65c.
2000 lb-carload	3.8c.	4.2c.	4.25c.

Silicomanganese

Contract basis lump size, per lb. of metal, f.o.b. shipping point with freight allowed. Add .25c. for spot sales. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05c.
2000 lb. to carload	6.70c.
Under 2000 lb.	6.90c.
Briquets, contract, basis carlots, bulk freight allowed, per lb.	5.80c.
2000 lb. to carload	6.30c.
Less ton lots	6.55c.

Ferrochrome

(65-72% *Cr.* 2% *max. Si*)

OPA maximum base contract prices per lb. of contained Cr, lump size in carload lots, f.o.b. shipping point, freight allowed to destination. Add .25c. per lb. contained Cr for spot sales.

	Eastern Zone	Central Zone	Western Zone
0.06% C	23.00c.	23.40c.	24.00c.
0.10% C	22.50c.	22.90c.	23.50c.
0.15% C	22.00c.	22.40c.	23.00c.
0.20% C	21.50c.	21.90c.	22.50c.
0.50% C	21.00c.	21.40c.	22.00c.
1.00% C	20.50c.	20.90c.	21.50c.
2.00% C	19.50c.	19.90c.	21.00c.
66-71% Cr, 4-10%	13.00c.	13.40c.	14.00c.
62-66% Cr, 5-7% C	13.50c.	13.90c.	14.50c.

FERROALLOY PRICES

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2c. per lb. to regular low-carbon ferrochrome price schedule. Add 2c. for each additional 0.25% N. High-carbon type: 66-71% Cr, 4-5% C, 0.75% N. Add 5c. per lb. to regular high-carbon ferrochrome price schedule.

Low-Carbon Ferromanganese

Contract prices per lb. of manganese contained, lump size, f.o.b. shipping point, freight allowed to destination, Eastern Zone. Add 0.25c. for spot sales.

	Carloads, Bulk	Ton Lots	Less Ton
0.10% max. C, 1 or 2% max. Si..	23.00c.	23.40c.	23.65c.
0.15% max. C, 1 or 2% max. Si..	22.00c.	22.40c.	22.65c.
0.30% max. C, 1 or 2% max. Si..	21.00c.	21.40c.	21.65c.
0.50% max. C, 1 or 2% max. Si..	20.00c.	20.40c.	20.65c.
0.75% max. C, 7.00% max. Si..	16.00c.	16.40c.	16.65c.

Ferrochrome Briquets

Contract prices per lb. of briquet, f.o.b. shipping point, freight allowed to destination. Approx. 60 per cent contained chromium. Add 0.25c. for spot sales.

	Eastern Zone	Central Zone	Western Zone
Carload, bulk..	8.25c.	8.55c.	8.95c.
Ton lots	8.75c.	9.25c.	10.75c.
Less ton lots..	9.00c.	9.50c.	11.00c.

Ferromanganese Briquets

Contract prices per lb. of briquet, f.o.b. shipping point, freight allowed to destination. Approx. 66 per cent contained manganese. Add 0.25c. for spot sales.

	Eastern Zone	Central Zone	Western Zone
Carload, bulk..	6.05c.	6.30c.	6.60c.
Ton lots	6.65c.	7.55c.	8.55c.
Less ton lots..	6.80c.	7.80c.	8.80c.

Calcium—Manganese—Silicon

Contract prices per lb. of alloy, lump size, f.o.b. shipping point, freight allowed to destination.

16-20% Ca, 14-18% Mn, 53-59% Si. Add 0.25c. for spot sales.

	Eastern Zone	Central Zone	Western Zone
Carloads	15.50c.	16.00c.	18.05c.
Ton lots	16.50c.	17.35c.	19.10c.
Less ton lots.	17.00c.	17.35c.	19.60c.

Calcium Metal

Eastern zone contract prices per lb. of metal, f.o.b. shipping point, freight allowed to destination. Add 5c. for spot sales. Add 0.9c. for Central Zone; 0.49c. for Western Zone.

	Cast	Turnings	Distilled
Ton lots	$1.80	$2.30	$5.00
Less ton lots..	2.30	2.80	5.75

Chromium—Copper

Contract price per lb. of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi River. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si. Add 2c. for spot sales.

Shot or ingot ..... 45c.

Ferroboron

Contract prices per lb. of alloy, f.o.b. shipping point, freight allowed to destination. Add 5c. for spot sales. 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern Zone	Central Zone	Western Zone
Ton lots	$1.20	$1.2075	$1.229
Less ton lots..	1.30	1.3075	1.329

Manganese—Boron

Contract prices per lb. of alloy, f.o.b. shipping point, freight charges allowed. Add 5c. for spot sales.

75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

	Eastern Zone	Central Zone	Western Zone
Ton lots	$1.89	$1.903	$1.935
Less ton lots..	2.01	2.023	2.055

Nickel—Boron

Spot and contract prices per lb. of alloy, f.o.b. shipping point, freight allowed to destination.

15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

	Eastern Zone	Central Zone	Western Zone
11,200 lb. or more ...	$1.90	$1.9125	$1.9445
Ton lots	2.00	2.09125	2.0445
Less ton lots..	2.10	2.1125	2.1445

Other Ferroalloys

Ferrotungsten, Standard grade lump or ¼X down, packed, f.o.b. plant at Niagara Falls, New York, Washington, Pa. York, Pa., per lb. contained tungsten, 10,000 lb. or more.... $1.90

Ferrovanadium, 35-55%, contract basis, f.o.b. producer's plant, usual freight allowances, per lb. contained Va.

Open hearth	$2.70
Crucible	$2.80
Primos	$2.90

Cobalt, 97% min., keg packed, contract basis, f.o.b. producer's plant, usual freight allowances, per lb. of cobalt metal..... $1.50

Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, any quantity, per lb. contained V_2O_5. Spot sales add 5c. per lb. contained V_2O_5..... $1.10

Silcaz No. 3, contract basis, f.o.b. producer's plant with usual freight allowances, per lb. of alloy. (Pending OPA approval)

Carload lots	25c.
2000 lb. to carload.....	26c.

Silvaz No. 3, contract basis, f.o.b. producer's plant with freight allowances, per lb. of alloy (Pending OPA approval)

Carload lots	58c.
2000 lb. to carload.....	59c.

Grainal, f.o.b. Bridgeville, Pa., freight allowed 50 lb. and over, max. based on rate to St. Louis

No. 1	87.5c.
No. 6	60c.
No. 79	45c.

Bortram, f.o.b. Niagara Falls

Ton lots, per lb.....	45c.
Less ton lots, per lb.....	50c.

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant with freight allowances, per lb. contained Cb.

2000 lb. lots	$2.25
Under 2000 lb. lots.....	$2.30

Ferrotitanium, 40-45%, 0.10%C. max. f.o.b. Niagara Falls, N. Y., ton lots, per lb. contained Ti.. $1.23
Less ton lots..... $1.25

Ferrotitanium, 20-25%, 0.10%C. max., ton lots, per lb. contained titanium $1.35
Less ton lots..... $1.40

High-carbon ferrotitanium, 15%-20%, 6-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y. freight allowed East of Mississippi River, north of Baltimore and St. Louis, per carload.....$142.50

Ferrophosphorus, 18% electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton..... 58.50

Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton $75.00

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., any quantity, per lb. contained Mo. 95c.

Calcium molybdate, 40-45%, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained Mo. ..... 80c.

Molybdenum oxide briquets, 48-52% Mo. f.ob. Langeloth, Pa. per lb. contained Mo..... 80c.

Molybdenum oxide, in cans, f.o.b Langeloth and Washington, Pa. per lb. contained Mo..... 80c.

Zirconium, 35-40%, contract basis, f.o.b. producer's plant with freight allowances, per lb. of alloy. Add ¼c. for spot sales

Carload lots	14c.

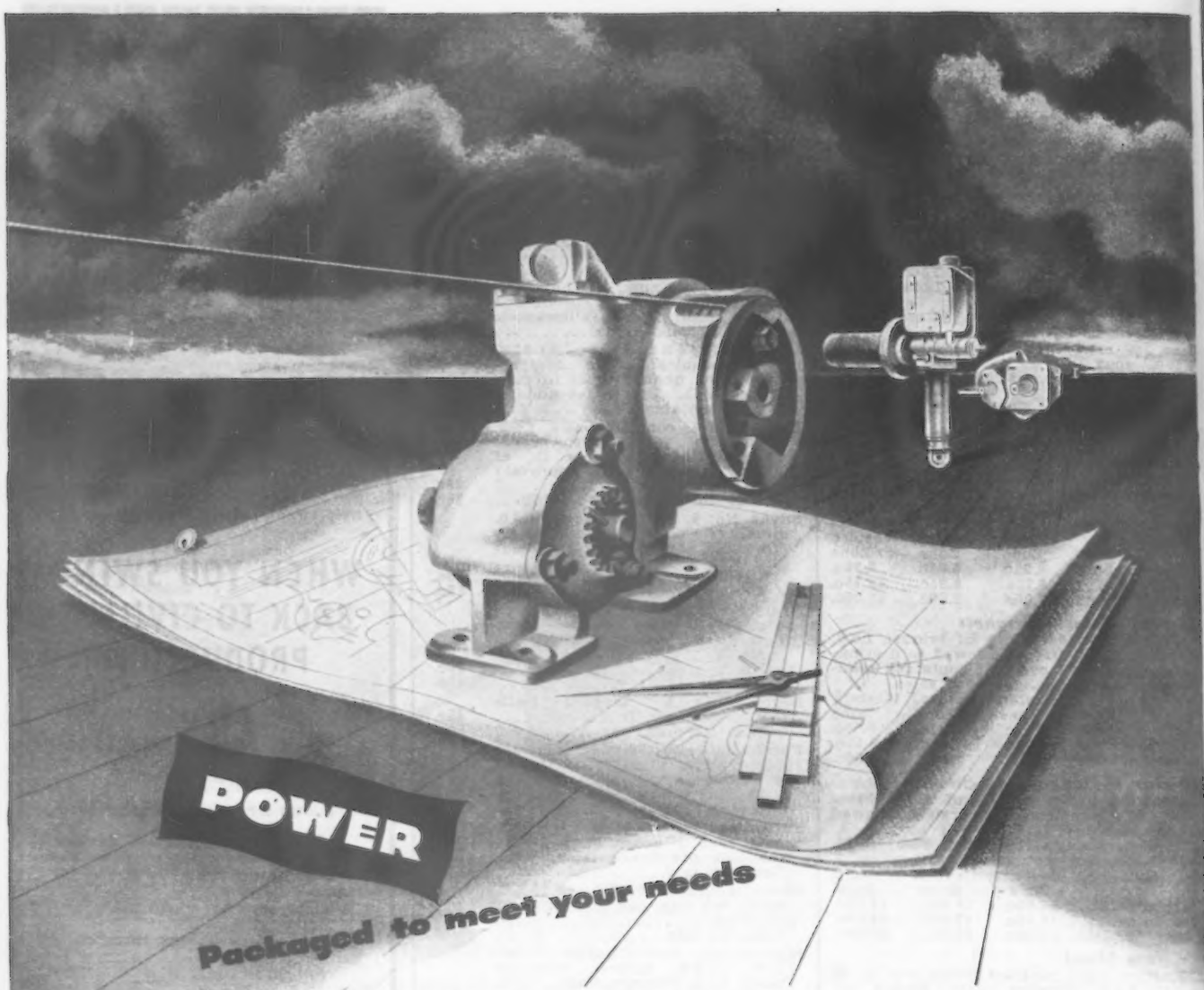
Zirconium, 12-15%, contract basis, lump f.o.b. plant usual freight allowances, per lb. of alloy

Carload, bulk	4.6c.

Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, carload, bulk ..... 5.75c.
Ton lots ..... 7.25c.

Simanal (approx. 20% Si, 20% Mn, 20% Al), contract basis, f.o.b. Philo, Ohio, with freight not to exceed St. Louis rate allowed, per lb.

Car lots	8.00c.
Ton lots	8.75c.
Less ton lots	9.25c.



Out of the war has come a new idea in the application of power. In cooperation with aircraft manufacturers, Foote Bros. engineers have developed small power units, compact in size, light in weight, yet exerting tremendous force. These power units are designed for accessory drives and to open and close ventilators, trim stabilizers, operate wing flaps, and perform many other jobs that otherwise would have to be done manually.

Right now in development in the laboratories at Foote Bros. are other applications of these power units—applications on peacetime machines and equipment—that will mean more efficient operation—that will result in definite competitive advantages.

Briefly, these packages of power can actuate linear or rotary motion positively, either by direct or remote control. They may be designed to have an operating force of a few pounds or several tons—they may do one job or simultaneously perform many.

For the machines or equipment you are manufacturing or planning to manufacture, Foote Bros. power units may assure you greater operating efficiency, more compact design, lighter weight, or better engineering. They may simplify your design problems and even make a design practical that without them would be impractical.

Foote Bros. engineers will gladly discuss the application of power units to your equipment.

A copy of this informative product engineering manual on "A-Q" gears will be sent to you on request.

FOOTE BROS. GEAR AND MACHINE CORPORATION, Dept. M, 5225 S. Western Blvd., Chicago 9, Ill.

FOOTE BROS.

Better Power Transmission Through Better Gears

HOW CHANGE OF METHODS CUT ANNEALING TIME 65%

BETHLEHEM "TROUBLE SHOOTER" BREAKS BOTTLENECK IN MIDWESTERN PLANT

OPERATION: Production of alloy-steel armor-piercing shot forgings, in a large plant in the Midwest.

PROBLEM: To cut production time. Quality of forgings was high, but difficulties in annealing had necessitated a slow process that drastically reduced the quantity of material turned out.

SOLUTION: The matter was referred to our home office by the producer of these forgings. A Bethlehem metallurgist went immediately to the plant in question, studied every phase of the annealing problem. After sifting the facts, he installed a system of isothermal annealing, by means of which a uniform lamellar structure was maintained.

RESULTS: Hardness comparable to that of lamellar perlite; *a time saving of more than 65 per cent* over the conventional method of slow furnace cooling.

A chip from the nose-forming tool. "Papier mâché" effect indicates good machining properties.

To Bethlehem "trouble shooters," cases like this one are an almost daily diet. Our metallurgists do not claim to be magicians, but their years of practical experience have fitted them well to solve problems brought on by wartime. Perhaps they can help you work faster and more efficiently with steels.

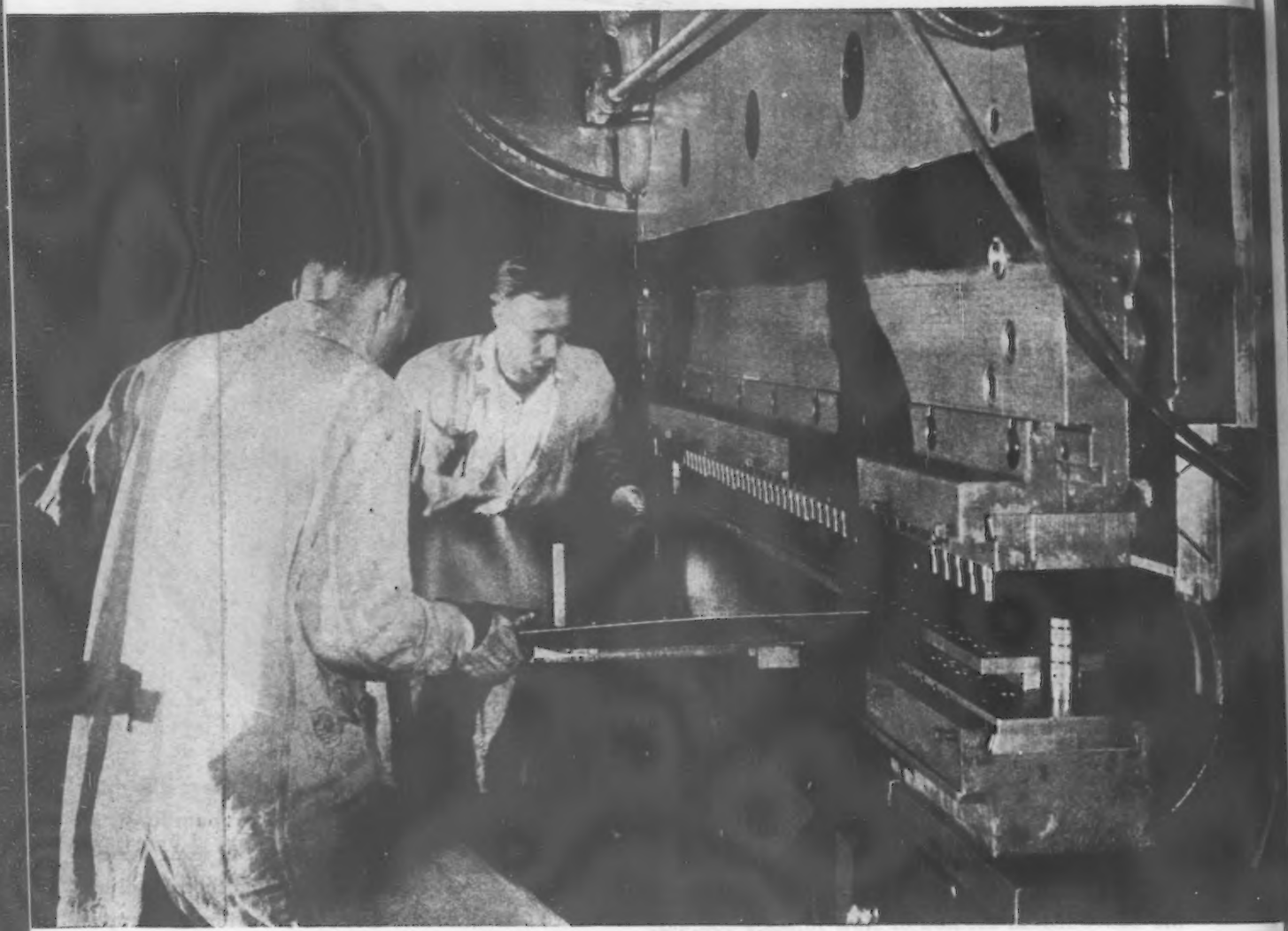
If you have a question regarding analyses, properties, heat-treating, or applications, always feel free to consult with Bethlehem technicians —on either present or postwar problems.

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.
BETHLEHEM STEEL EXPORT CORPORATION, New York

★ BETHLEHEM STEEL ★

Punch it...

on a CINCINNATI PRESS BRAKE



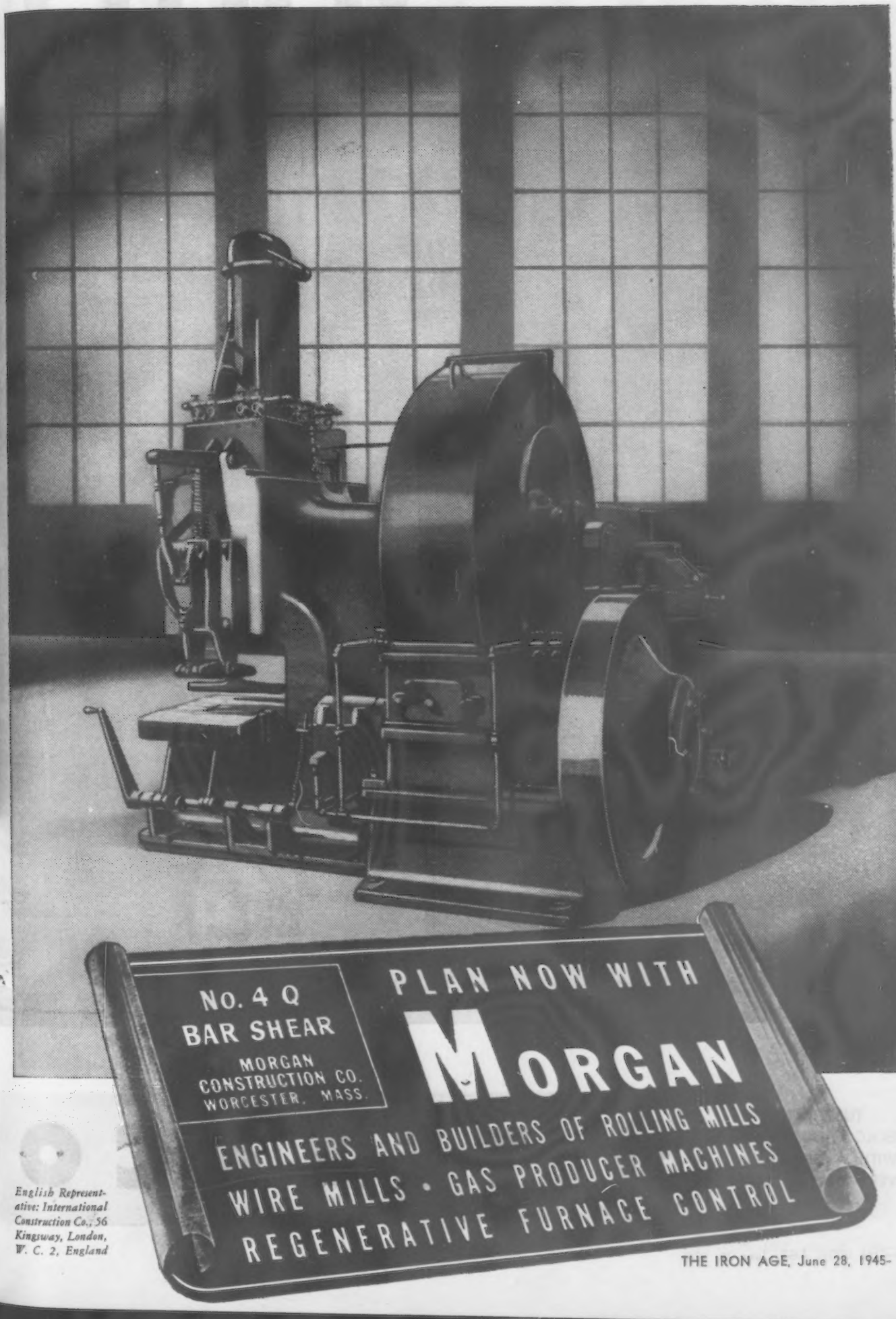
Gang punching, as well as a great variety of forming, notching, combination notching and forming, trimming and punching . . . all are being done on Cincinnati Press Brakes.

Write for Catalog B-2, illustrating the possibilities of a Cincinnati Press Brake in your shop. Consult our Engineering Department on your punching and forming problems.

THE CINCINNATI SHAPER CO.

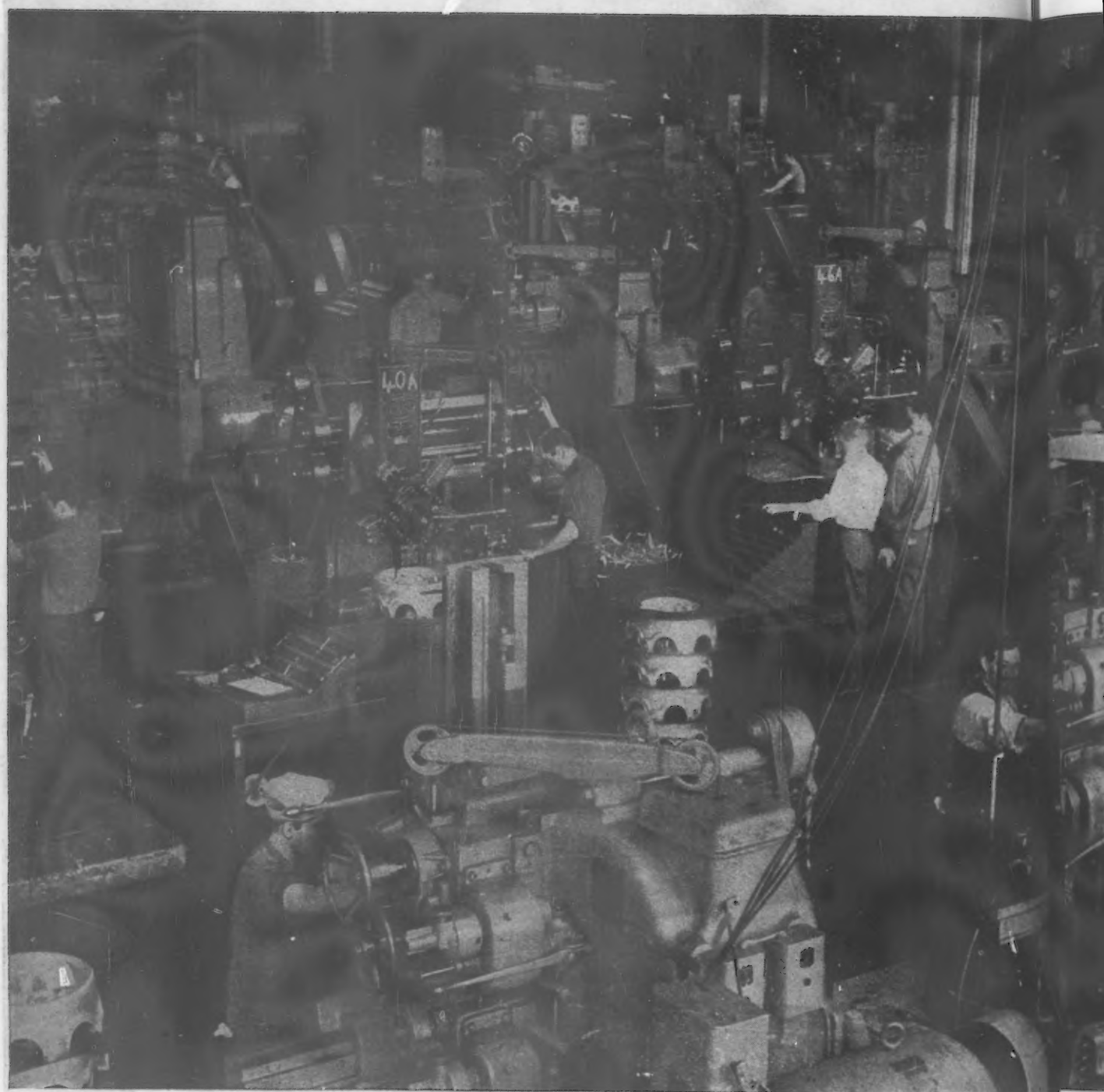
CINCINNATI OHIO U.S.A.

SHAPERS · SHEARS · BRAKES



English Representative: International Construction Co., 56 Kingsway, London, W. C. 2, England

RUSTP



TUNE IN THE
TEXACO STAR THEATRE
WITH JAMES MELTON
EVERY SUNDAY NIGHT
—CBS

TEXACO

PROOFING

GOVERNMENT-OWNED PRODUCTION EQUIPMENT

SEE Ordnance Specification P.S. 300-4 for official instructions

USE Texaco Rustproofing Products

RECONVERSION time—when it comes to your plant—will call for prompt storage of Government-owned machines, precision tools and other production equipment. Before this equipment can be stored it must be rustproofed and processed *in accordance with official instructions.*

Ordnance Specification P.S. 300-4 gives exact specifications for rustproofing materials to be used on Government-owned equipment. Texaco rustproofing products meet Ordnance specifications. They are easily applied by brush, dip or spray, and the protective coating provided will assure preservation for years.

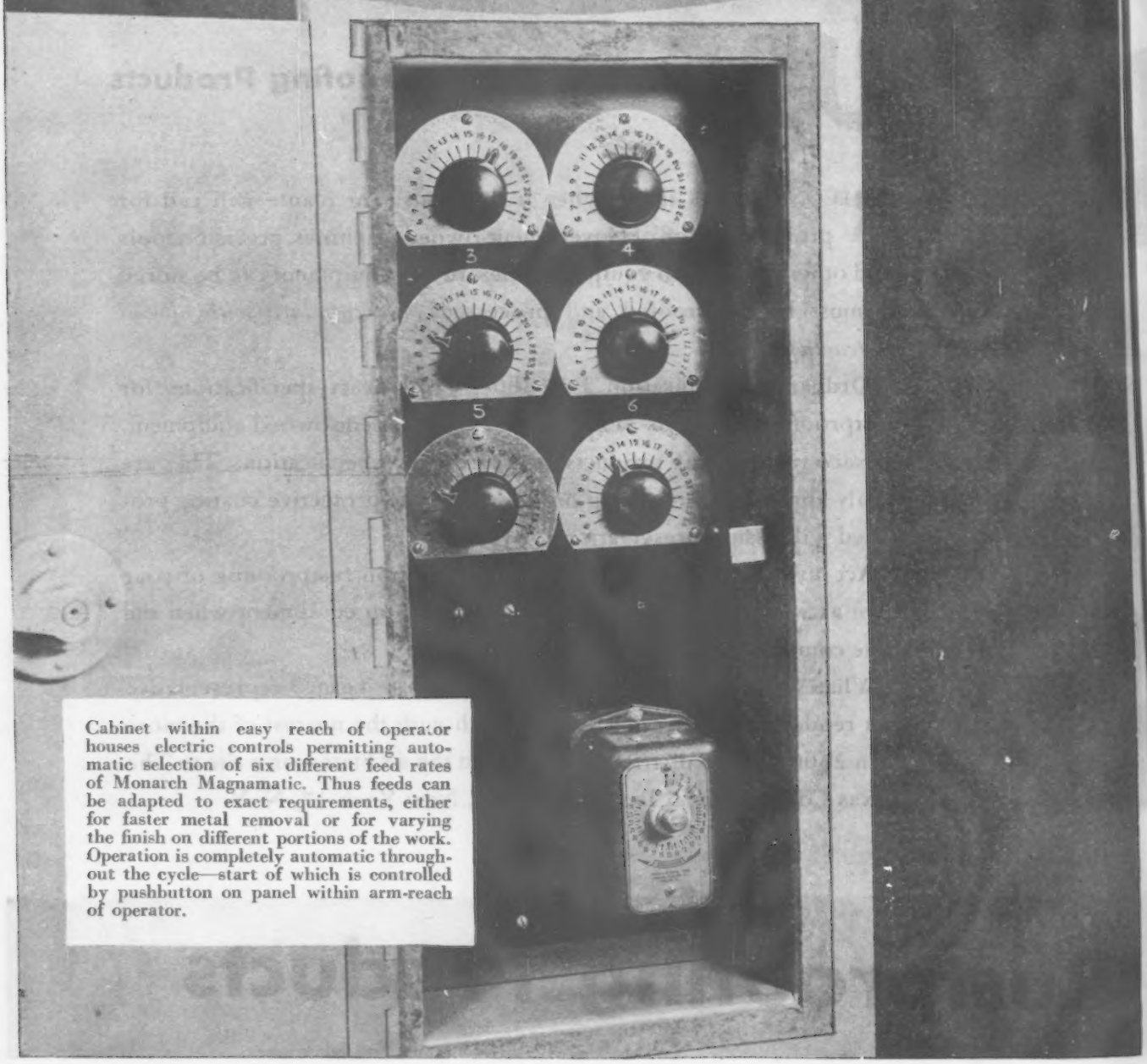
Act now to be ready for prompt reconversion rustproofing of your own as well as Government-owned production equipment when the time comes.

Whatever your rustproofing requirements, a Texaco representative can render helpful service. Get in touch with the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write to The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Rustproofing Products

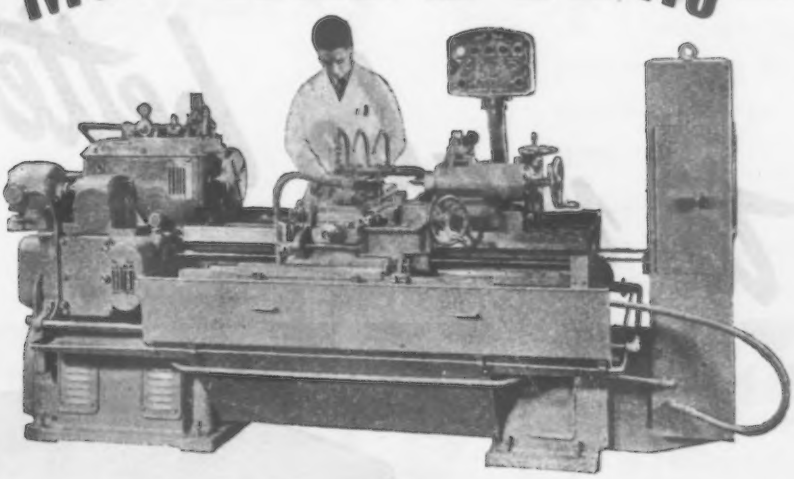
6 DIFFERENT FEED RATES ON 1 AUTOMATIC CYCLE...

6 help remove metal faster on



Cabinet within easy reach of operator houses electric controls permitting automatic selection of six different feed rates of Monarch Magnamatic. Thus feeds can be adapted to exact requirements, either for faster metal removal or for varying the finish on different portions of the work. Operation is completely automatic throughout the cycle—start of which is controlled by pushbutton on panel within arm-reach of operator.

on Monarch Magnamatic



This feature alone makes the Magnamatic a profitable investment for a wide variety of automatic turning, boring or facing work. Add to it the advantages of exceptionally fast setup (as described at right) and you can see why Magnamatics have been so successful in peace and war production over the past ten years.

For runs as short as 25 pieces, this fully automatic, double carriage, all-electrically controlled machine will show amazing cost reductions. For long runs, the savings are still more substantial. A 10-year record for successful operation proves the time and cost-saving ability of the Magnamatic.

Ask our nearest representatives for complete information and suggestions on how you can utilize the Magnamatic to cut costs on turning, boring or facing work.

THE MONARCH MACHINE TOOL CO. · SIDNEY, OHIO

DIRECT FACTORY BRANCHES

CHICAGO 6, ILLINOIS
622 W. Washington Blvd.
Phone: Randolph 4295

CLEVELAND 6, OHIO
Room 209 Upper Carnegie Bldg.
10465 Carnegie Avenue
Phone: Garfield 2590

DETROIT 2, MICHIGAN
801 Fisher Building
Phone: Trinity 1-0425

INDIANAPOLIS, INDIANA
Maco Building
38 and College Avenue
Phone: Wabash 2650

NEWARK 2, NEW JERSEY
635 Industrial Office Bldg.
Phone: Mitchell 2-1770

PITTSBURGH 22, PENNSYLVANIA
512 Empire Building
Liberty Ave. and Stanwix St.
Phone: Atlantic 6428

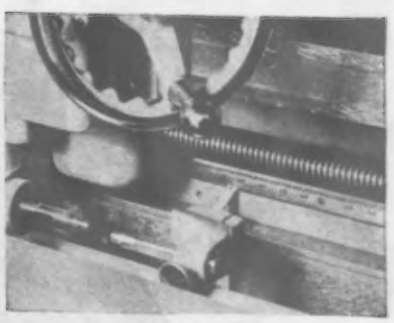
Representatives in Principal Cities

Monarch Saves Time

REMARKABLY QUICK SETUP MAKES SHORT RUNS PROFITABLE

With setup time as low as five minutes in many cases, the Monarch Magnamatic is especially valuable for short runs—profitable even down to 25 pieces. Convenient handwheels and micrometer adjustments provide quick and accurate setup facilities.

Scale and pointer on tailstock for ready positioning of tailstock for various lengths of work. This eliminates necessity of repositioning on setup.



Quick positioning of stops controlling the longitudinal travel of carriage is provided by scale pointer with micrometer finger-tip adjustment.

Another quick setup feature of Monarch Magnamatics is the finger-tip control of travel to the slides, provided by this easy-reading and accurate micrometer adjustment.

Pilots, Gyro Flight Instruments, Magnetos, Motors.

bearings!

FROM the days of the first wheel on up through the ages, increasingly better and more accurate bearings have made it possible for man to step up his rate of travel from a plodding mile per hour to nearly a thousand times that speed today.

The mechanisms that now hurl a human being through the air at twelve miles a minute often call for bearings that must run at 400 *revolutions a second and more!*

To provide perfectly sized and perfectly matched balls for such precise bearings and to sort them *fast enough* to keep pace with the demands of war, the Electronics Department at Jack & Heintz developed the Automatic Ball Gauge.

IT'S DONE WITH ELECTRONICS!

When fed commercial balls—already graded to a tolerance of 1/20,000 inch—this machine sorts them into groups *five times more accurate!* As many as ten size selections can be made, each group being separated by only *ten millionths of an inch,* and it's done *fast* and *automatically.* The operator needs only to fill the plexiglass hopper and remove the sorted balls. One operator handles four machines easily; these four machines sort more balls and do it far more accurately than 32 skilled operators using conventional measuring equipment.

HOW CAN JACK & HEINTZ HELP YOU?

The automatic ball sorter is just one example of how Jack & Heintz engineers have solved a great many such problems. If you are developing new designs or are concerned with post-war production problems, this is the kind of engineering skill and know-how that is available to help you.

Buy More War Bonds and Stamps

JACK & HEINTZ
Incorporated

Electrical Way to Get More Ingots

—WITH AN ALLIS-CHALMERS ARC FURNACE SUBSTATION

LOWERING OPERATION costs and boosting ingot output of arc furnaces is the aim of Allis-Chalmers in designing unit-responsibility substations — like the one illustrated below.

Elements featured in the drawing are quick-acting Regulex electrode control, and a low maintenance furnace switch for disconnect duty, coordinated through the operator's control with furnace transformer and control current transformers.

The sturdy disconnecting switch is expressly designed for repetitive arc furnace duty. Only slight maintenance is needed . . . contacts are long-lived.

Allis-Chalmers also supplies a low-maintenance air blast interrupter for service up to 22,000 volts.

Revolutionary Regulex control, shown below, pays dividends to operators by making possible extra "heats" per day . . . because it's faster-acting.

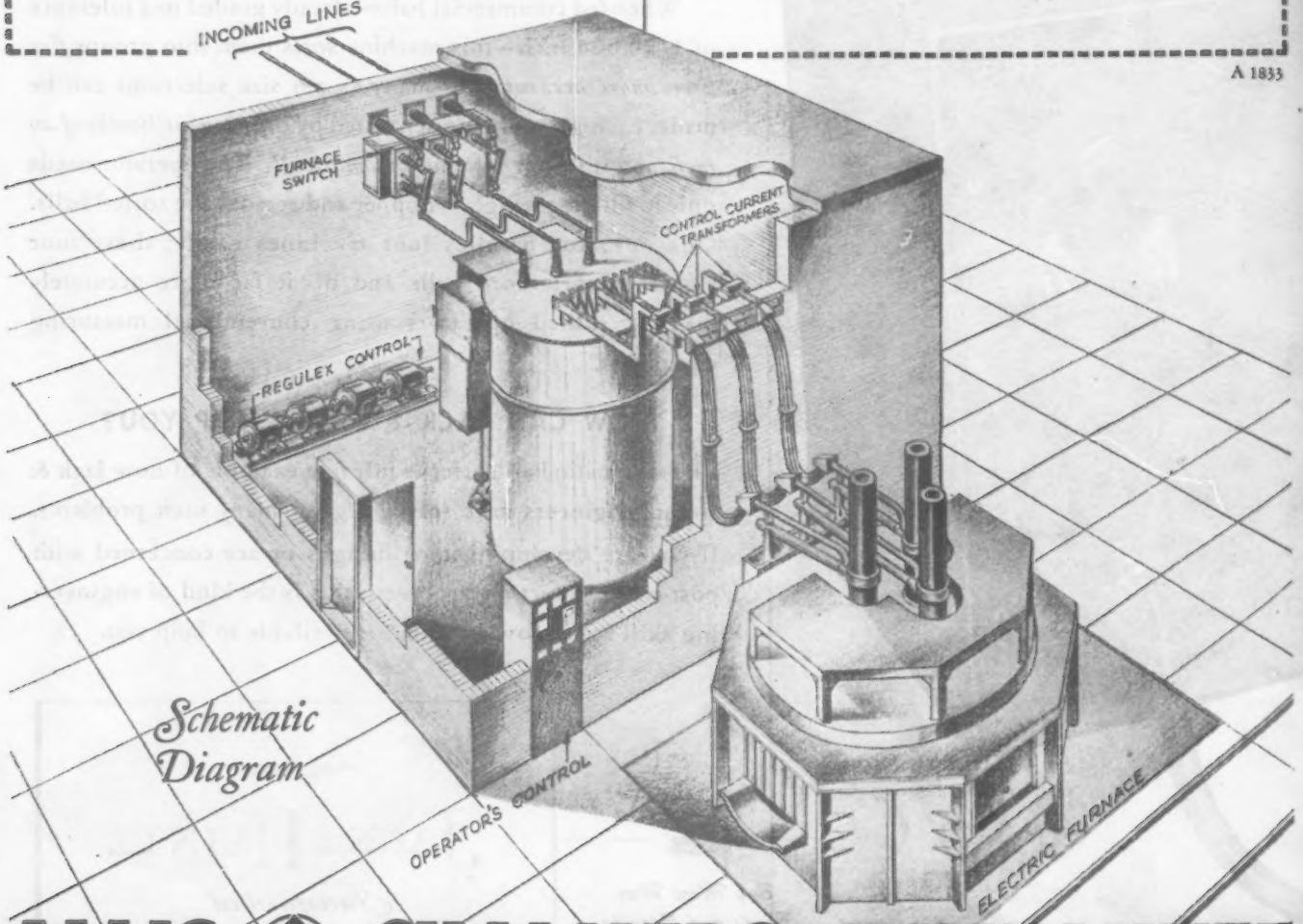
The Regulex set has no contactors to maintain. Its great amplifying characteristics and instant response to arc current and voltage eliminate power waste — and *all* with the ruggedness and reliability of standard rotating electrical machinery!

As added features, Regulex control can be equipped with flywheels which automatically raise electrodes when power fails, and an auxiliary generator, for making the control independent of a d-c shop source when desired.

Remember, Allis-Chalmers makes a complete line of furnace electrical equipment. There's undivided responsibility — no "buck-passing."

For complete information, call our district office. Or write direct to ALLIS-CHALMERS, MILWAUKEE 1, WIS.

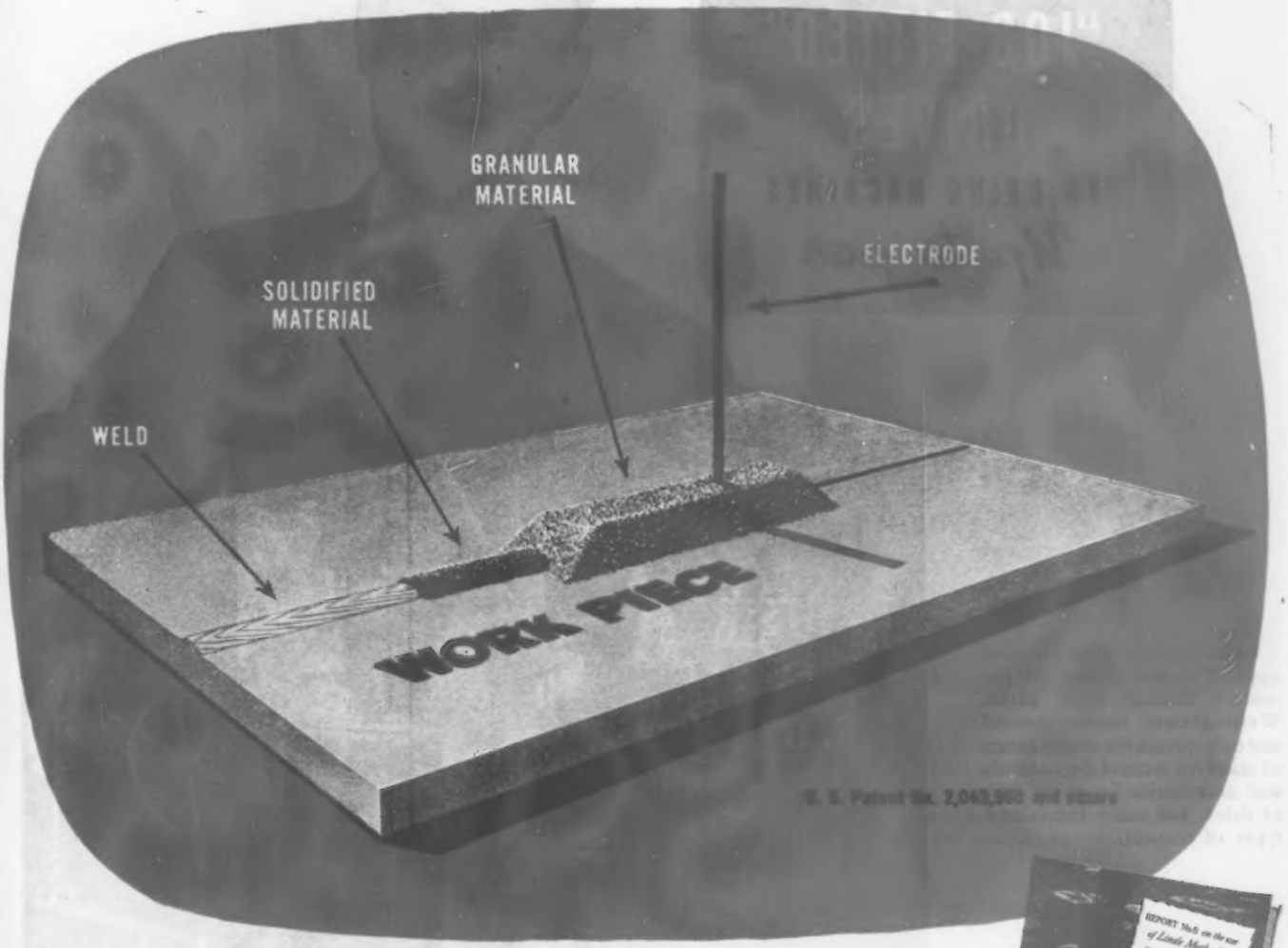
A 1833



Schematic Diagram

ALLIS AC CHALMERS · MILWAUKEE

THIS IS UNIONMELT WELDING



UNIONMELT Welding is easy to recognize. It is electric welding done as diagrammed above—and it makes top quality welds at speeds that are greater than with any other similarly applicable process!

UNIONMELT Welding, a process of welding electrically beneath a mineral melt, has received wide application since U. S. Patent No. 2,043,960 was issued. It is the electric welding process that is rated by many as one of the most important factors in the great wartime fabrication of steel.

Anyone may obtain a license to use UNIONMELT Welding through its developers—The Linde Air Products Company.

Linde can supply a wide variety of equipment and materials to apply UNIONMELT Welding. Linde representatives can help you determine where you can use the UNIONMELT process advantageously and what type of equipment is best suited to your work.

For additional information send for the folder "Report No. 6 on the Use of Linde Methods in Mass Production."

MARITIME "M" AWARD FOR OUTSTANDING PRODUCTION ACHIEVEMENT

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

The word "Unionmelt" is a registered trade-mark of The Linde Air Products Company.

★ BUY UNITED STATES WAR BONDS AND STAMPS ★

"JOB-FITTED" DRIVES

TO BRING MACHINES

Up to par

Control properly selected and applied makes it easy to put motors through their paces. Westinghouse motor control not only covers the entire range of standard a-c and d-c controls and accessories for every type of drive, but many specialized types of control.

. . . ONE OF 22 WAYS YOUR

WESTINGHOUSE DISTRIBUTOR

CAN HELP YOU MODERNIZE

Electrically

TWENTY-ONE OTHER WAYS your Westinghouse Distributor can help you in planning electrical modernization, whether for a single department or your entire plant, are suggested in this new book. It provides a valuable check list on modern electrical practices . . . from incoming electrical power to methods of utilization and control. Ask your Westinghouse Distributor today for a copy of B-3476, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

For efficient, trouble-free speed reduction within the standard range of 1 to 75 hp—use a Westinghouse Gearmotor. You buy your power *pre-packaged* at the speed you want—ready for simple, instant assembly.

Bought now, Westinghouse Type CSP prelubricated motors need no greasing till 1950! Extensively field tested, prelubricated ball bearings in Westinghouse CSP general-purpose motors have proved they can operate five years . . . 24 hours a day . . . without greasing. This feature is standard on CSP motors up to 3 hp.

Motors, like people, can be square pegs in round holes. You may have improvised but you will need motors that are "job-fitted" to compete with the newly-built, highly efficient war plants.

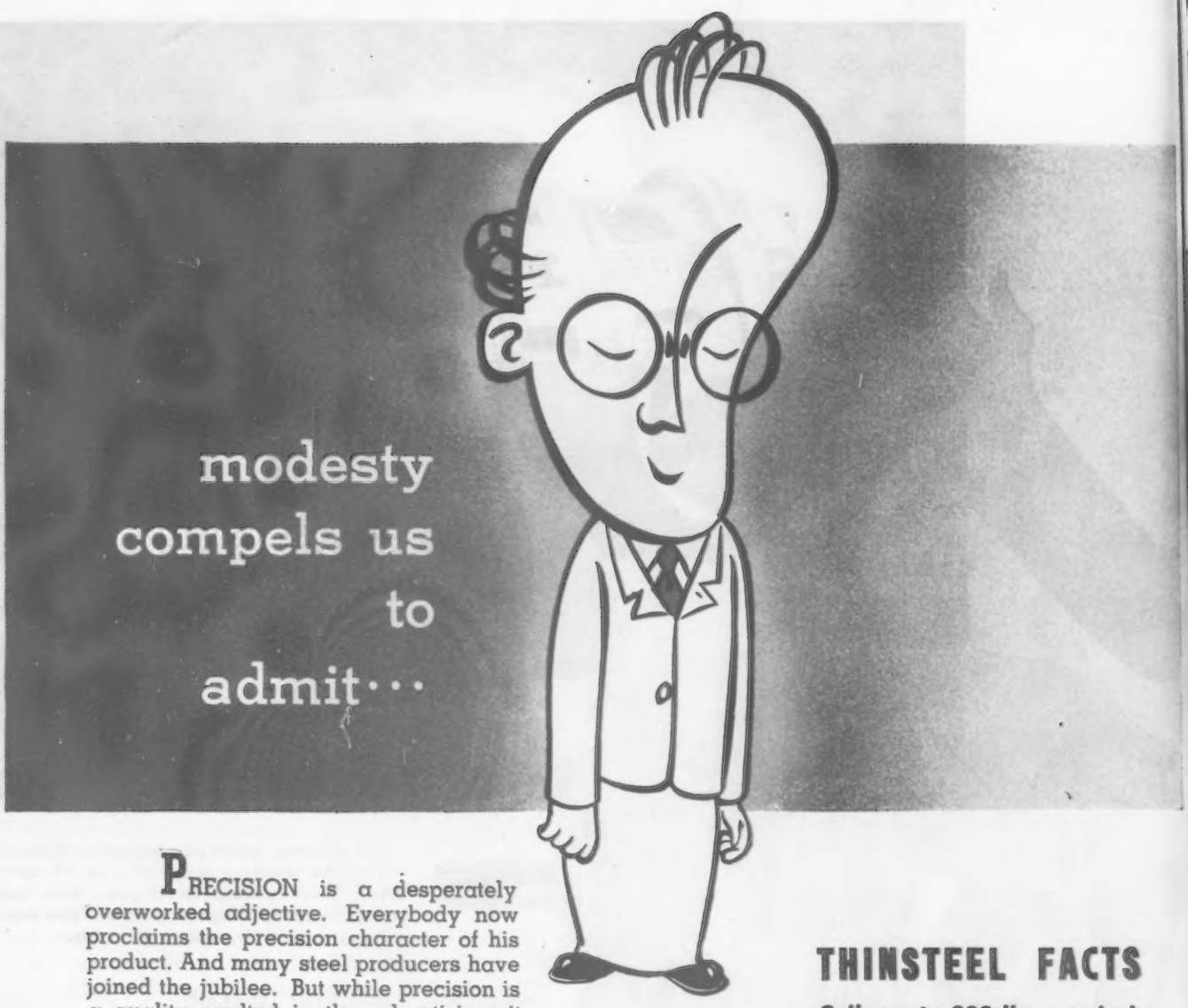
Your Westinghouse Distributor is equipped to help you. He will make a thorough survey of your motor drives, plus a full electrical checkup of your work, to make sure you are using the most efficient motor drive. He'll also tell you what's new about a lot of things electrical . . . and suggest ways in which you can "revitalize" or replace equipment which is now obsolete or inefficient.

"Job-fitted" motor drives are just one example of the completeness of the service he has to offer. Westinghouse also offers *all* types of motors, control and gearmotors to "revitalize" your plant from A to Z. These are only a few of the hundreds of items he can supply to help you "modernize electrically".

Why gamble on electrical equipment and motor drives that you know are doubtful? Check up now . . . revitalize . . . replace . . . with the help of your Westinghouse Distributor. J-90562

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



PRECISION is a desperately overworked adjective. Everybody now proclaims the precision character of his product. And many steel producers have joined the jubilee. But while precision is a quality exalted in the advertising, it sometimes fails to show in the finished steel item.

CMP designed and put into operation the first rolling mill equipment capable of consistent production of great quantities of flat-rolled metals to degrees of accuracy then unknown. CMP, therefore, can be forgiven its application of the term PRECISION to its Cold Rolled Strip Steel. The CMP product still leads all others in this characteristic. Users of strip steel know that the accuracy-to-gauge and uniformity of physicals, finish and shape recited in CMP advertising are to be found regularly in CMP PRECISION Strip Steel.

Better your products and profits through use of CMP'S cooperative service for metal fabricators. Write a description of the metal you need, or tell us of your fabrication plans and problems. We'll send our recommendations to you promptly.

THINSTEEL FACTS

Coils up to 300 lbs. per inch of width
Carbon and alloy grades
Extremely close tolerances
Wide range of physicals
Widths up to 24 inches

THE COLD METAL PRODUCTS CO.

Subsidiary of

THE COLD METAL PROCESS CO.
YOUNGSTOWN 1, OHIO

GLEASON ENGINEERING SERVICE . . . FOR DESIGNERS OF GEAR DRIVES

BEVEL GEARS
- Straight
- Spiral
- Zerol
- Hypoid

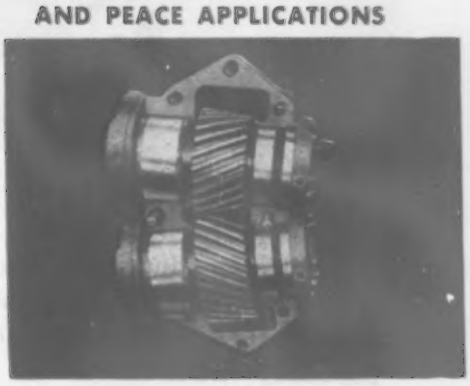
for POWER TRANSMISSION AT ANY ANGLE

Do your bevel gear designs meet these 3 tests?

1. Are the gears of the type, material, size and pitch best suited to the requirements of the drive?
2. Is the design of the gears such that they can be easily manufactured?
3. Are the mountings designed to maintain the alignment and position of the gears under operating loads and speeds?

Before your designs are frozen, send your preliminary layouts to the Gleason Works. Our 75 years experience in making power "turn a corner" is at your service. We will be glad to check your gears by these 3 tests, offer recommendations for improving the drive and prescribe machines for manufacturing the gears. When writing, please include data on the horsepower and speed required, the type of loading (constant, intermittent or shock) and the driving member and direction of rotation.

BEVEL GEARS FOR A LARGE VARIETY OF WAR AND PEACE APPLICATIONS



Angular spiral bevel gears . . . for PT boat V-drives

Large spiral bevel gears . . . for continuous rod mill drives

GLEASON WORKS

Builders of Bevel Gear Machinery for Over Seventy-five Years

1000 UNIVERSITY AVENUE, ROCHESTER 3, N. Y., U. S. A.

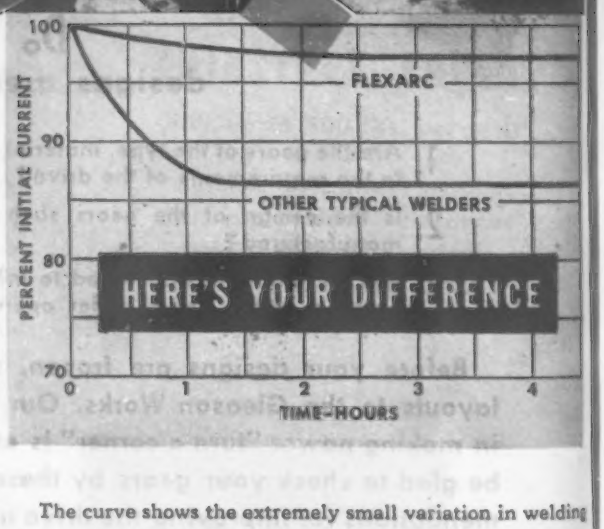
NO CURRENT DROP HERE

That's why operators prefer a Westinghouse Flexarc Welder. Current is rock steady. Metal melts fast at a uniform rate. One adjustment gives the exact current desired. There is no drop-off when the machine warms up.

But there is another reason for the increase in Flexarc popularity—it's *Arcontrol*—the new welding feature that gives a choice of three types of arc. "Normal" range gives fast, flexible operation that meets most conditions. But when conditions get tough, set the Arcontrol at either "A" or "B" range and instantly you get the kind of arc needed to complete the job—quickly and efficiently.

Just two controls—set the Arcontrol—select the current—no other adjustments are needed—simplified operation that can help you speed operator training.

And with Flexarc on the job, you'll have a machine that is built to give years of service. The Flexarc Welder is completely enclosed in a one-piece, seamless steel frame. There are no extra tin boxes—all vital parts are inside. For complete details about the Flexarc, write for Folder DB 26-100-1, Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-21334



The curve shows the extremely small variation in welding current during the "warm-up" period of a Flexarc Welder as compared to the pronounced variation of a conventional welder.

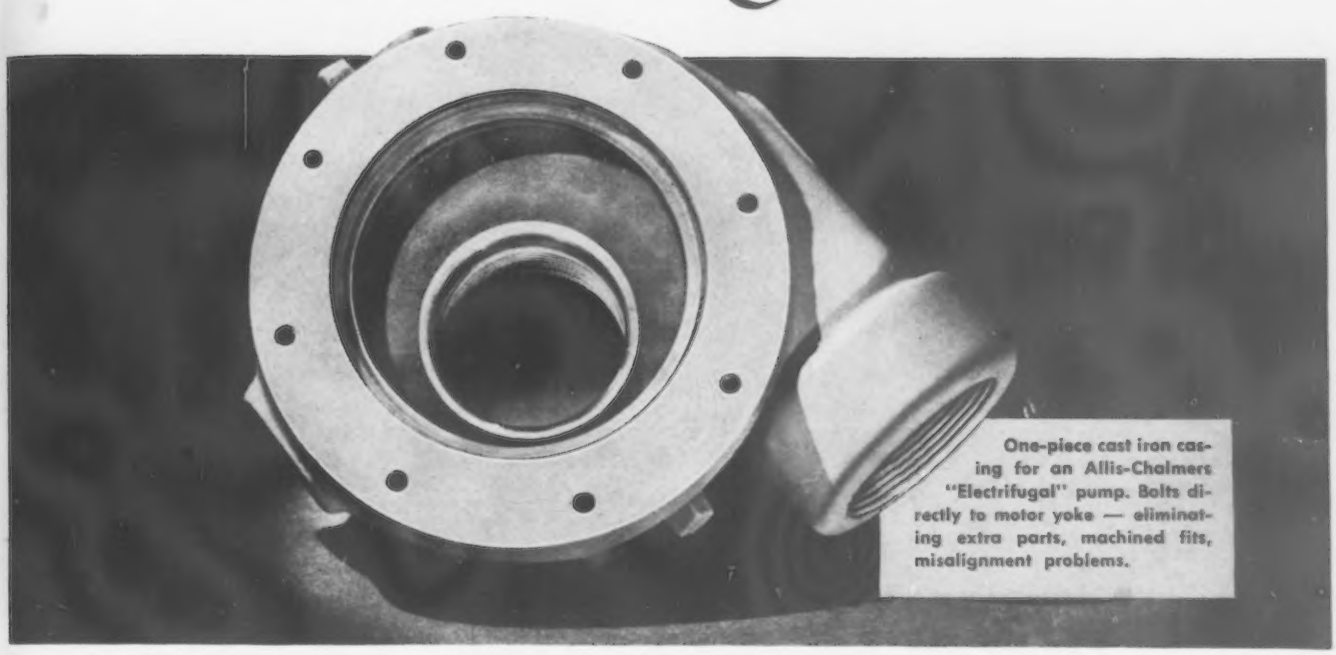
With the Flexarc system of current control, welding current falls off only imperceptibly as the set warms up. Current never varies more than 5% during transition from cold to hot. In conventional type welders this current variation is often as great as 25%—and equilibrium might not be reached for several hours.

Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

FLEXARC WELDERS

[PUMP TIPS FROM ALLIS-CHALMERS—ONE IN A SERIES]

How to make CASINGS Last Longer . . .



One-piece cast iron casing for an Allis-Chalmers "Electrifugal" pump. Bolts directly to motor yoke — eliminating extra parts, machined fits, misalignment problems.

ABRASION AND CHEMICAL REACTION are the major causes of casing wear. For if liquid is gritty, or contains foreign matter; or casing is not constructed of the right materials for the pumping service required — casing life is materially shortened. A minor cause of direct casing wear is misalignment.

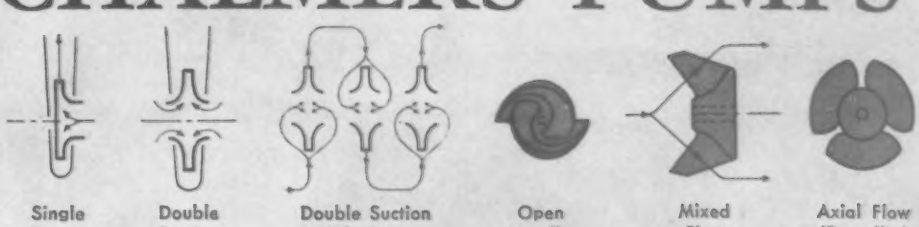
Original engineering of a pump can help prevent this wear. For example, Allis-Chalmers "Electrifugal" pump minimizes trouble from these sources in two ways: 1 — casings can be supplied in iron, bronze, stainless steel or other materials — depending upon type of service. 2 — It is a *unit-design* pump. Both impeller and motor are mounted on *one* shaft and in *one* frame. This means fewer parts, fewer fits — no chance for misalignment.

However, regardless of pump design, scheduled maintenance is still necessary if you expect to get longest wear from your casings. Some ways to do it . . .

- Check all piping supports regularly to see that they're effectively supporting the load.
- Every 6 months check piping itself to see whether it has shifted in any manner. Disconnect suction and discharge piping to see if it springs in any direction. Check the alignment of pump and motor — shimming up units as required.
- Once a year clean and inspect casing for wear, deposits or pitting. Make necessary repairs.
- If foreign matter is being sucked into pump, wearing casing unduly, provide the intake end of suction piping with a suitable screen.
- Send for your *free* copy of "Handbook for Wartime Care of Centrifugal Pumps". This valuable booklet applies to *all makes* of pumps; contains *no* advertising. ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS. A 1755

ALLIS-CHALMERS PUMPS

Allis-Chalmers builds all types and variations of pumps shown at right. Capacities from 10 to 150,000 gpm—heads to 2500 lbs.



Single Suction | Double Suction | Double Suction Multi-Stage | Open Impeller | Mixed Flow | Axial Flow (Propeller)

General view of the plant

The byproduct plant

The pusher side of the coke-oven battery

This

Koppers coke-oven plant

helped meet

a serious problem

A steel mill, built at tidewater in the southwest, to produce steel for the oil fields, was designed to operate almost wholly on scrap from those oil fields. The rapid depletion of the scrap reserves during the war presented a serious problem to the management.

This was overcome by the construction of blast furnace facilities and a coke-oven plant. The coke ovens were built by Koppers and this company also designed and built a small but complete plant for the recovery and refining of other products from the coal carbonization process. The photographs on these pages illustrate the equipment designed and built by Koppers.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

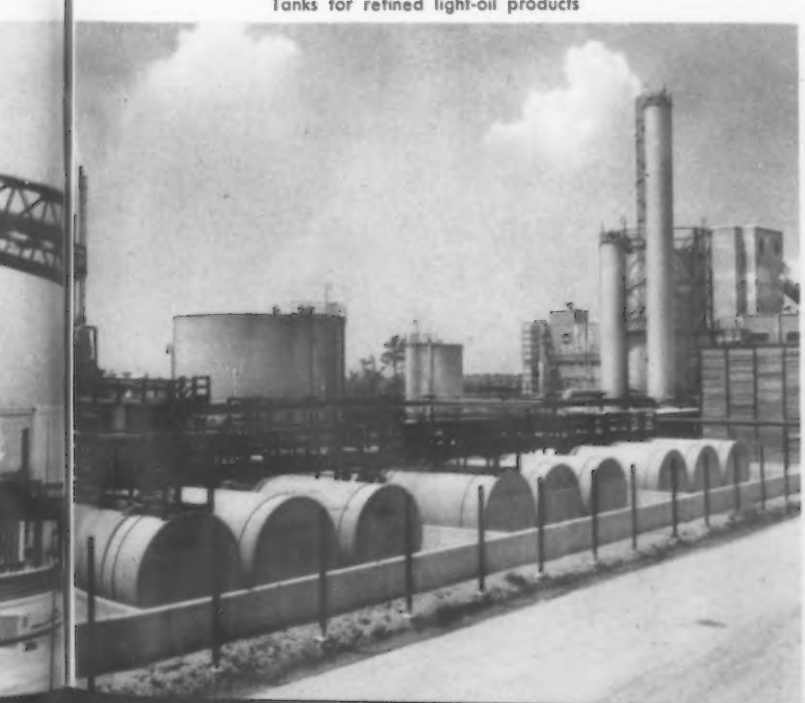
KOPPERS COMPANY, INC.

ENGINEERING AND CONSTRUCTION DIVISION

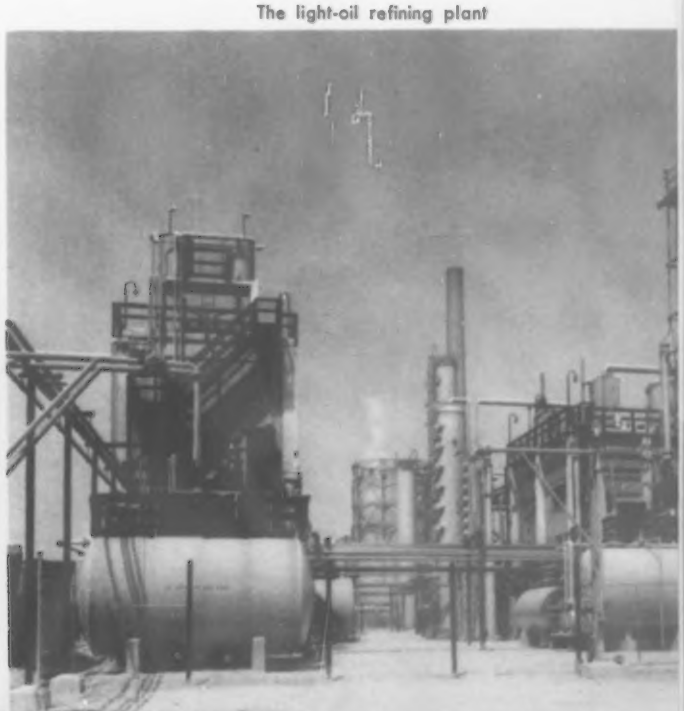
Pittsburgh 19, Pa.

Buy War Bonds . . . and keep them

Tanks for refined light-oil products



The light-oil refining plant



TRAMRAIL CRANES

Indispensable for Efficient Production

Even though most parts could be moved by hand in this electrical factory, production is speeded and safety improved by employing inexpensive cranes with electric hoists.

Plenty of cranes in this Diesel motor plant ease the work and boost production.

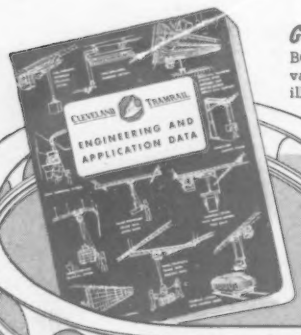
Three things which are held extremely important to modern industrial plants are achieved by the use of simple Cleveland Tramrail overhead cranes:

(1) Production is speeded
(2) Costs are cut
(3) Safety is improved

Cranes save many costly man-hours of skilled mechanics by enabling one man, in most cases, to pick up and move heavy or awkward parts that ordinarily require hard and dangerous work by several men when lifting and tugging by hand.

Even where light loads are lifted only a few times a week, it has come to be realized that the cost of Cleveland Tramrail cranes is well justified because they are a tremendous factor in the elimination of hernias, smashed hands and feet, wrenched backs and other unnecessary injuries.

Progressive plants regard overhead materials handling equipment as indispensable.



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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1115 EAST 283RD ST. WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Here's a practical, modern short cut to

GREATER WEIGHT SAVINGS

without sacrifice of STRENGTH or SAFETY

ELECTRUNITE tubular frame construction is the answer! It saves weight in buses, trucks and other types of equipment, because tubing has a higher strength-to-weight ratio than any other type of structural member. Less weight means increased revenue for the operator. More pay-load may be hauled without increase in consumption of power—or the same pay-load hauled with a reduction in operating costs.

While ELECTRUNITE tubular frames are light in weight, they also are strong, safe and rigid. They provide greater riding comfort, because they absorb ordinary road shocks and eliminate severe jolts. Collision damage is localized at the point of impact, due to the shock-absorbing qualities of tubular construction.

Republic ELECTRUNITE Tubing—cold formed from flat-rolled steel and electric resistance welded into tubing—is consistently uniform in wall thickness, diameter, roundness and workability. It is available in carbon steels from 3/16" to 5" O.D. from 3 to 22 gauge, and in stainless steels from 3/8" to 3" O.D. from 13 to 22 gauge . . . in round, square, rectangular and other shapes.

For more information on the many other advantages of welded ELECTRUNITE tubular frame construction, see your equipment builder or write directly to:

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO
Export Department: Chrysler Building, New York 17, New York

Republic
ELECTRUNITE
Reg U. S. Pat Off
TUBING

Mechanical, Aircraft, Stainless Steel and Boil Steel Tubing—Boiler, Condenser and Heat Exchanger Tubes

In heat treating tools and dies, tool maker reports INCONEL carburizing boxes in excellent condition after 3 years

In the plant of the Heyman Mfg. Co., Kenilworth, N. J., boxes made of Inconel sheet by the Michigan Steel Castings Co., Detroit, are used in the heat treating of stamping dies and tools.

In this operation, the boxes are subjected to carburizing at approximately 1800° F. Recent examination showed them to be in excellent condition after more than three years of service.

Inconel . . . the INCO Nickel Alloy especially recommended where strength and resistance to oxidation are required at high temperatures . . . provides trouble-free service in many varied heat treating applications.

For further information, write for the new technical bulletin, "INCO Nickel Alloys for Long Life in Heat Treating Equipment." Address: The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

TOOL MAKER PLACING INCONEL *carburizing box, containing stamping dies and tools packed in carburizing compound, in furnace heated to approximately 1800° F. Inconel boxes of the type shown, made by Michigan Steel Castings Co., Detroit, were in excellent condition after more than 3 years of this service.*

NICKEL INCO TRADE MARK **ALLOYS**

MONEL* • "K" MONEL* • "R" MONEL* • "KR" MONEL* • "S" MONEL* • INCONEL* • "Z" NICKEL* • NICKEL

Sheet . . . Strip . . . Rod . . . Tubing . . . Wire . . . Castings . . . Welding Rods (Gas & Electric)

*Reg. U. S. Pat. Off.

two methods of buying a

Continuous Buttweld Pipe Mill

1

Place orders with several different firms for the component parts, furnace, coiler, descaler, welder, and then engineer and install the mill yourself or . . . . . .

2

Place the order and responsibility for the entire mill with Aetna-Standard. We will design, engineer, and install the mill *complete* from hot mill to finishing floor under one contract. In fact, Aetna-Standard engineers will supply general plans and do the foundation drawings if you wish.

Aetna-Standard Has Built 8 Continuous Buttweld Pipe Mills

Aetna-Standard has had more experience in designing, engineering, and building pipe and tube mills than any other company. In addition to all types of mill machinery, we have been constructing seamless and buttweld mills since 1904. Aetna-Standard, and only Aetna-Standard, has the equipment and experience to engineer and build a continuous buttweld pipe mill *complete*.

DESIGNERS AND BUILDERS to the Steel, Non-Ferrous and Chemical Industries

THE AETNA-STANDARD ENGINEERING CO.

YOUNGSTOWN, OHIO

ASSOCIATED COMPANIES:

HEAD, WRIGHTSON & COMPANY, LIMITED, THORNABY ON TEES, ENGLAND

JOHN INGLIS COMPANY, LIMITED, TORONTO, ONTARIO, CANADA

Something to look forward to

As you formulate your plans for conversion to peacetime production, look to Peninsular for the newest advancements in the fabrication and application of abrasive wheels.

During four long years of expanded effort to meet the requirements of industry at war, Peninsular field and research engineers have constantly pressed their search for new materials — new methods — better ways to manufacture grinding wheels and apply them to the problems of production.

From this new wartime experience combined with the knowledge gained in nearly 60 years of pioneering, Peninsular promises you something to look forward to in the peacetime manufacturing days ahead.

A STANDING INVITATION

Our expert staff of factory and field engineers are ready today to help in your postwar preparation — with a production, engineering and cost analysis service beyond any offered up to now in the industry.

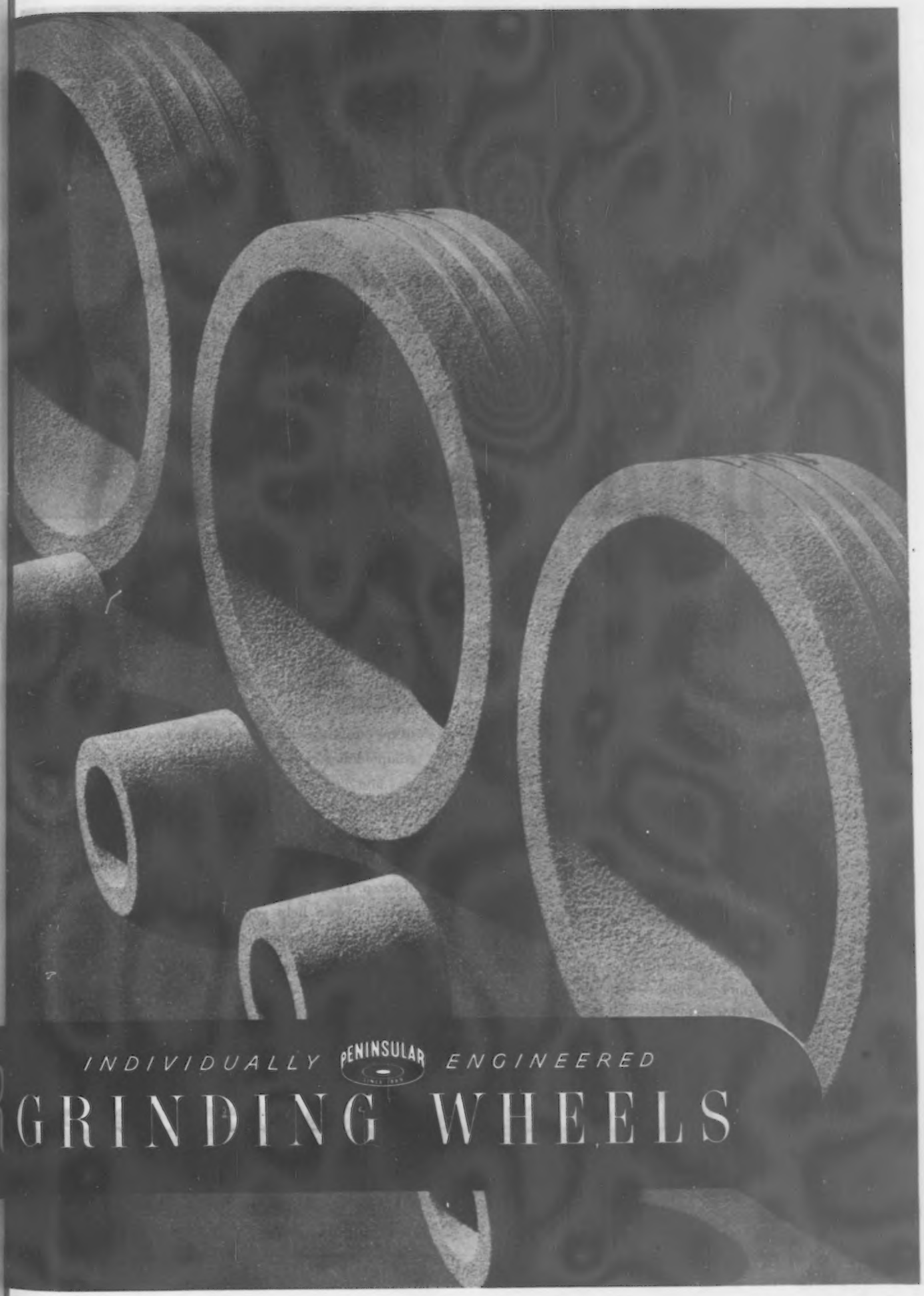
The Peninsular Grinding Wheel Company, 729 Meldrum Ave., Detroit 7. *Sales Offices:* Chicago, Philadelphia, Cleveland, Newark, Pittsburgh.

SPECIALISTS IN RESINOID BONDED WHEELS

PENINSULAR

SINCE 1889

Cylinder wheels for various types of surface grinding


INDIVIDUALLY PENINSULAR ENGINEERED
GRINDING WHEELS

Heavier DRAWS . . . *Less* SCRAP

. . . *Longer* DIE LIFE!

Quaker Research, *plus* new type raw materials, produce *sensational* new

QUAKER DRAWS

IF QUAKER research chemists and engineers had been content to employ only *conventional* types of raw materials in developing drawing compounds, the metal industries would not now be enjoying the superior performance of modern QUAKER DRAWS.

For example, the newest QUAKER DRAW —#140—contains a *new type pigment.* This so effectively cushions and lubricates the die that heavier-than-ever work can be handled . . . with far less scrap . . . with much longer die life.

Mixed with from 2 to 8 parts water, QUAKER DRAW #140 makes an excellent all-purpose die lubricant that is easy to mix and pleasant to handle . . . provides very effective protection against rust when left on drawn parts . . . and can be removed in an alkaline bath, even after long storage.

Another Quaker development, especially advantageous in forming parts to be porcelain enameled, is QUAKER DRAW #4-60. This compound completely *burns off* when drawn parts are welded and greatly reduces the amount of metal finishing required. Other new Quaker compounds give exceptional results on *stainless steel* and *aluminum.*

QUAKER DRAWS are now helping plane and armament manufacturers set new records in production . . . in die life . . . and in reduction of scrap. Tomorrow, these same manufacturing economies can help your peacetime products meet and beat competition!

A Quaker Process Engineer will gladly work with you now to obtain the maximum advantages which these new compounds make possible!

QUAKER CHEMICAL PRODUCTS CORP.

CONSHOHOCKEN, PA.

Other Plants in CHICAGO and DETROIT Warehouse Stocks in Principal Industrial Centers

For more details on QUAKER DRAWS, fill in below, tear out and mail

A Progressive Organization of Research and Process Engineers and Manufacturing Chemists

Name_____ Position_____

•••PLEASE PRINT COMPANY NAME AND ADDRESS IN MARGIN BELOW•••

—no other material can equal ALLOY STEELS

When reduction in size of gears, such as those being lapped above, or other working parts, is indicated to save weight or space, or to improve performance, the safe answer is alloy steels.

These fine steels have the highest strength values of all materials. They also provide the maximum strength per pound of material involved.

And that isn't all. They rank at the top in toughness. They have the ability to resist severe shocks and concentration or reversal of stresses. And they retain their high strength over long periods of time—thus resisting the attack of fatigue.

Alloy steels are unequalled in their uniform and predetermined response to hardening treatments —providing any depth of hardness desired and insuring against soft spots in wearing surfaces.

Alloy steels resist both sub-zero cold and red hot temperatures. They insure against embrittlement and failure due to conditions of extreme cold. They also can be used successfully where they must operate while extremely hot.

If you want to reduce weight or size—to insure safety—to lengthen life of trouble-free service—ask Republic, world's largest producer of alloy steels, what these fine steels can do for you.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Republic
ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

Preformed wire rope

MULTIPLIES MANPOWER 3 WAYS

Men who actually work with wire rope prefer preformed. They give many different reasons for this choice, but the net result is more work per line before replacement.

The men say preformed wire rope handles easier. It saves installing time; it's limber—not cranky.

They say it whips less and spools better on drums.

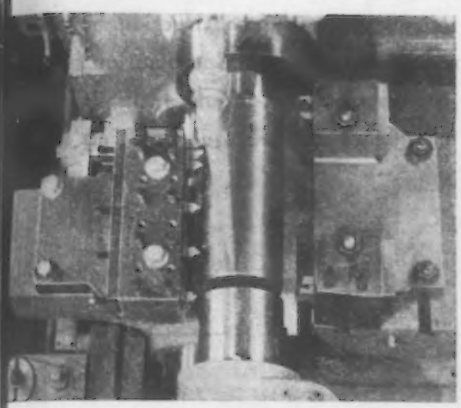
It lasts longer and this means fewer interruptions to production.

Preformed wire rope costs a little more at first but much less in the long run.

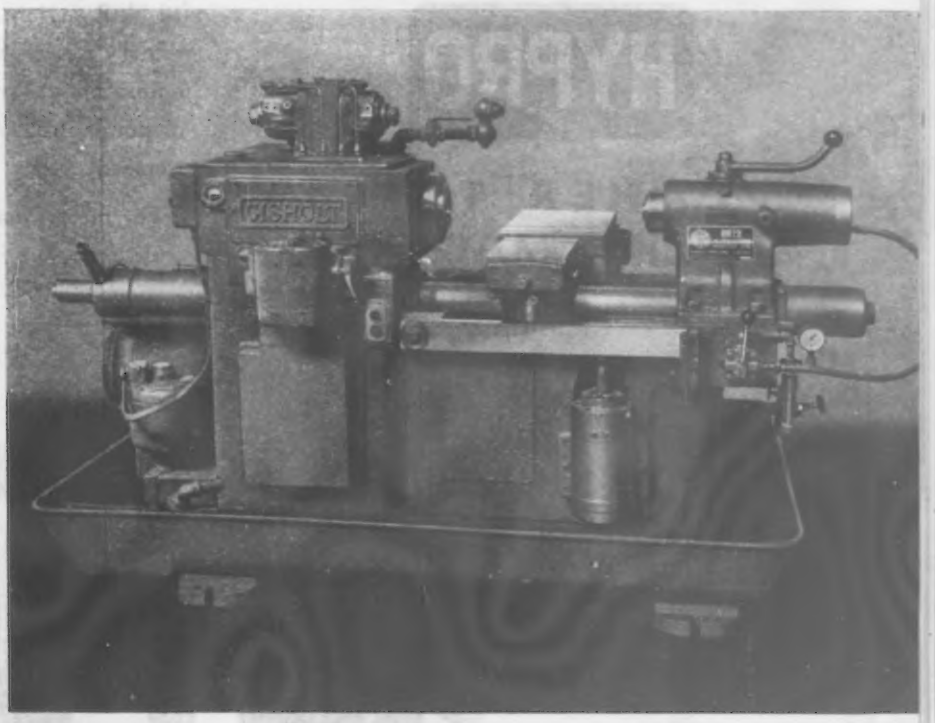
ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

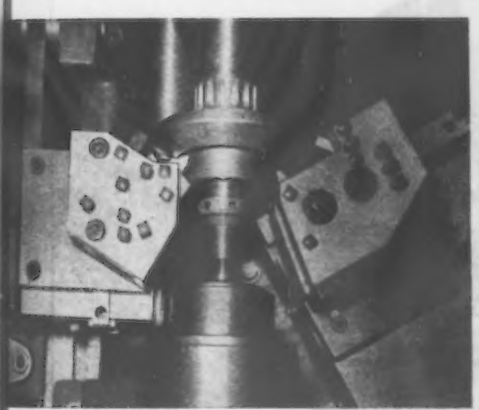
AN AUTOMATIC LATHE

can be versatile too!

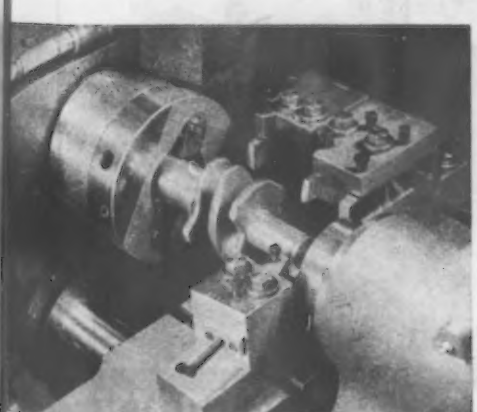


Machining Diesel cylinder liners. Automatic tool relief and fading out tool pressure at point of overlapping cuts, eliminates rings and grooves in the finished surface.





Bevel gears and other work having angular surfaces are machined without auxiliary slides, cams, taper attachments, etc., because rear slide can be set at any angle.



On crankshaft jobs like this, heavy turning and cheek facing with rough intermittent cuts are readily handled with real power and all-around rigidity.

THE GISHOLT NO. 12 HYDRAULIC *demonstrates it!*

On this modern automatic lathe, independent hydraulic feeds are provided for front carriage and rear slide, assuring smooth constant feeds with an infinite selection from ".000 to .060." Both slides are heavy and wide, permitting ample room for substantial multiple tool blocks.

On the front carriage, the top slide is equipped with micrometer dial and screw for easy adjustment of tools. Simple cam plates may be applied to the carriage support bar for special contour and taper turning. Rear slide may be set in any position for facing, turning or machining of angular surfaces.

Slides feed against and dwell at positive dead stops, insuring utmost precision. Elimination of feed gears, mechanical trips, cams, etc., greatly simplifies changes of set-up.

GISHOLT MACHINE COMPANY

1215 E. Washington Ave. • Madison 3, Wisconsin

Look Ahead . . . Keep Ahead . . . With Gisholt Improvements in Metal Turning

TURRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES • SPECIAL MACHINES

YOUR PLANT NEEDS THIS POSTWAR MACHINE

QUAD-ACTION

HYPRO

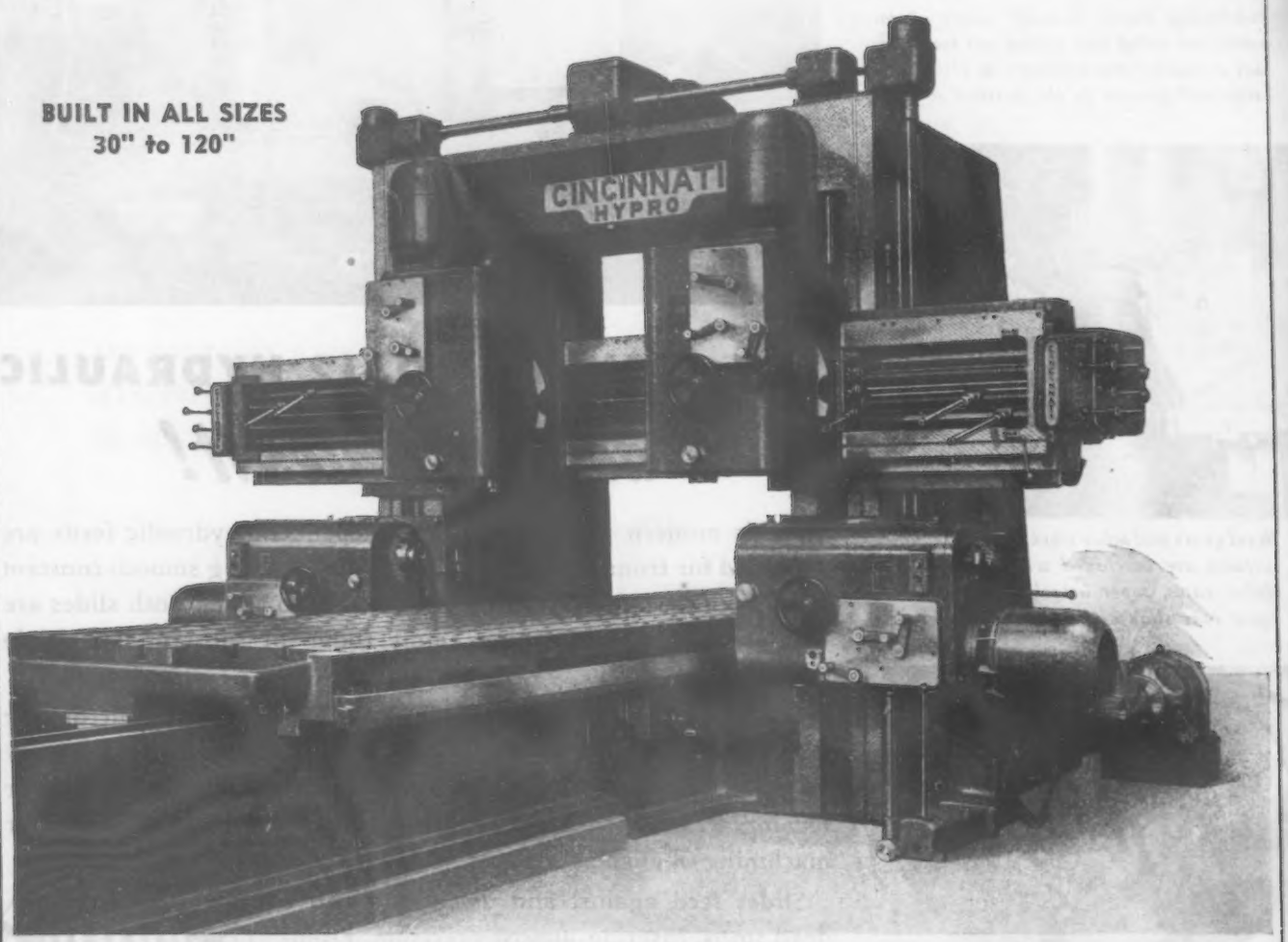
PLANER TYPE MILLING MACHINE

In the highly competitive post-war period, the Hypro Planer Type Miller offers exceptional advantages.

Its four heads work simultaneously and perform several operations at once—using only one set-up—saving time and manpower. Each head is individually powered with a 10 H. P. motor. Its massive, compact construction, scientifically reinforced, adds to its rigidity. Combination herringbone gear drive to table assures smooth transmission of power, free from all side thrusts and guaranteeing extreme accuracy.

For more information regarding this versatile machine and its applications, write today for Catalog I-105.

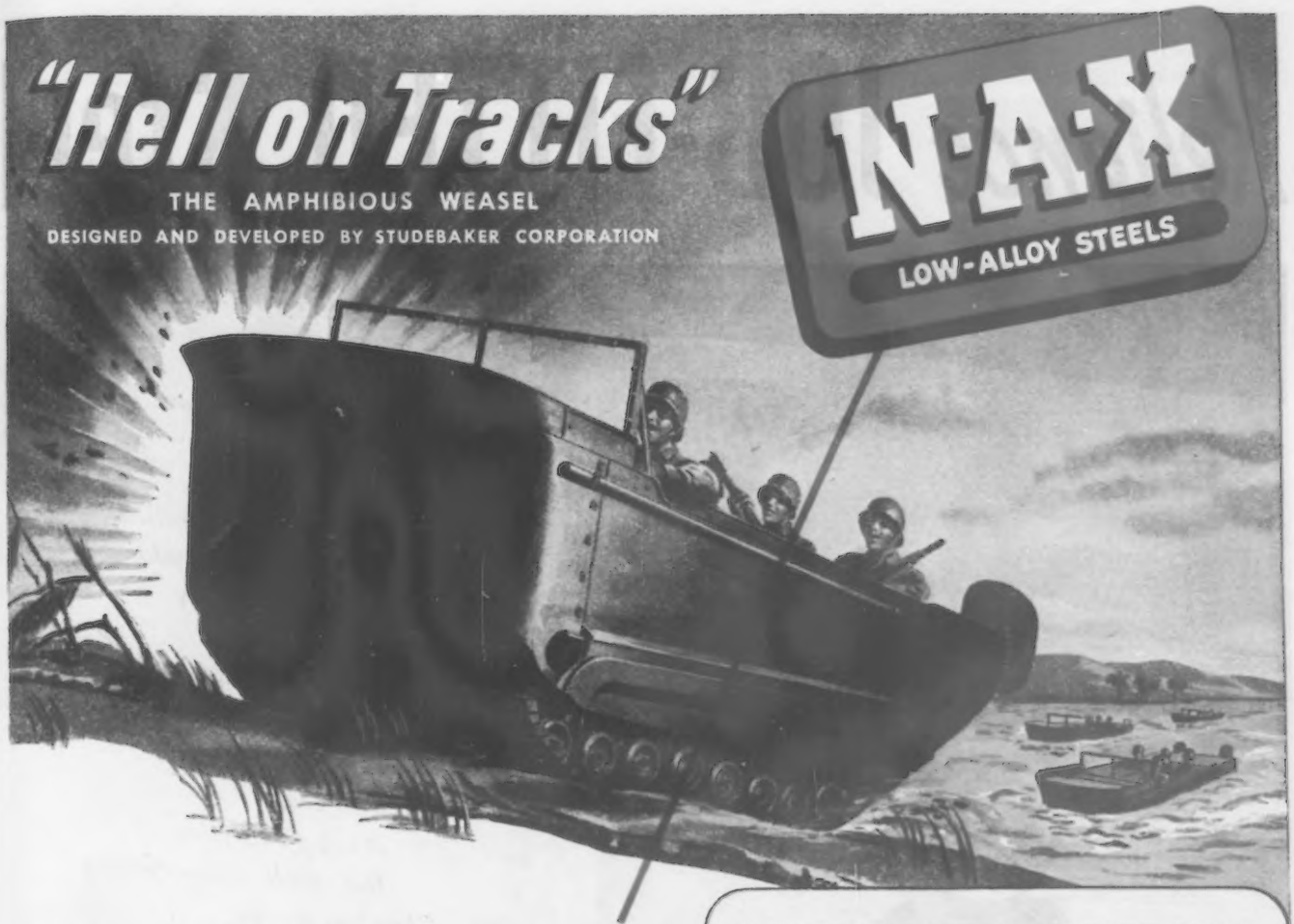
BUILT IN ALL SIZES
30" to 120"



THE CINCINNATI HYPRO PLANER COMPANY

PLANERS - BORING MILLS - PLANER TYPE MILLERS

CINCINNATI, OHIO



DUCTILITY—STRENGTH—TOUGHNESS PUT N-A-X 9120 ON THE JOB

The track assembly parts of the amphibious Weasel call for something pretty special in *steel* to meet the requirements.

It must have *ductility* to permit cold-forming into difficult stampings. And it must have good *hardenability* and response to heat-treatment to make it strong and tough.

N-A-X 9120 combines these properties in one great steel, and provides in addition excellent weldability for the fabrication of the track shoe. Together, these track parts furnish a good example of the outstanding work being done with versatile N-A-X alloy steels. Consult Great Lakes for assistance in determining the best steel of this series for your particular requirements.

HEAT-TREATED TRACK ASSEMBLY PARTS COLD-FORMED OF N-A-X LOW-ALLOY STEEL


CROSS PLATE


GUIDE


BOTTOM GUIDE WHEEL


TOP GUIDE WHEEL


SHOE

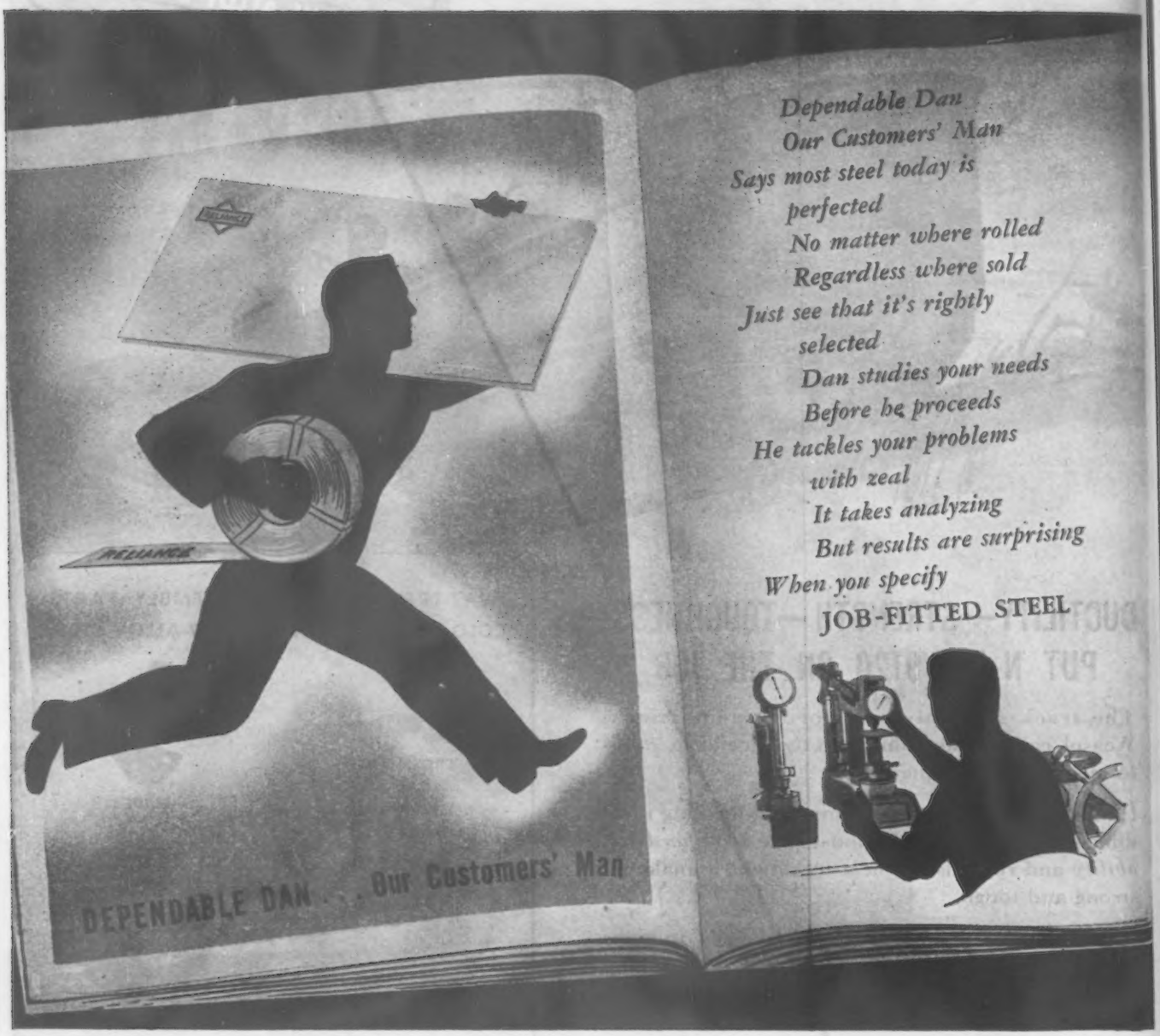
GREAT STEELS FROM GREAT LAKES

GREAT LAKES STEEL *Corporation*

N-A-X ALLOY DIVISION · DETROIT 18, MICHIGAN

UNIT OF NATIONAL STEEL CORPORATION

Reliance JOB-FITTED Steel



• PROCESSORS and DISTRIBUTORS of STRIP and SHEET STEEL •

RELIANCE STEEL DIVISION

DETROIT STEEL CORPORATION

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RELIANCE STEEL CORP. OF CANADA, WINDSOR, TORONTO
WASHINGTON CUSTOMERS' BUREAU, 300 BOND BUILDING, WASHINGTON 5, D. C.

No need to worry about springs when your new plans take shape . . . the familiar functions of these dependable mechanical aids will be available instantly . . . ready to give your products a quick start on the way to new popularity and success.

At both B-G-R spring plants, experienced engineering and production skills will meet your needs without delay. From machine guns to vacuum cleaners, from wartime "tracs" to trucks, from airplanes to automobiles . . . whatever shift your plans may require . . . you'll find that B-G-R springs are *quick converters* . . . easing the road back to normal production levels.

Call B-G-R
for quick spring action !

SMALL STAMPINGS
WIRE FORMS

BGR Springs · Wire Forms · Small Stampings

ARMY E NAVY

BARNES-GIBSON-RAYMOND

DIVISION OF ASSOCIATED SPRING CORPORATION

TWO PLANTS FOR SPRING SERVICE
DETROIT and ANN ARBOR MICHIGAN

B-G-R PRODUCTS SERVE OUR COUNTRY ON LAND, AT SEA, AND IN THE AIR

THE BAZOOKA

BRAZED and HARDENED By Electronic Heating

The history of the "bazooka" is one of the outstanding success stories of this war. Just as outstanding is the part electronic heating has played in its manufacture.

Made in two sections for easy portability, the barrel of the gun is jointed in the middle with flanged collars and three locking lugs.

One collar is brazed to the front section at the rate of 120 per hour. Four brazes are made simultaneously, on four separate bazookas, with *one* G-E 15-kw electronic heater. Another identical heater is used to braze the other collar to the rear section.

After brazing, the locking lugs are hardened in a third G-E 15-kw heater at the rate of 375 lugs, or 125 bazookas, per hour. Both the heating and the quenching cycles are automatically controlled.

This is another example of the way electronic heating is helping to speed war production. With this versatile process, you can braze, harden, anneal, or solder—and the heated zone can be confined within close limits. For details, simply contact the nearest G-E office, or write to General Electric Company, Schenectady 5, N. Y.

THREE G-E ELECTRONIC HEATERS are used in producing the bazooka, two for the brazing operations, one for hardening.

THIS MULTIPLE FIXTURE is used to harden the lugs on four barrels simultaneously. First, one lug on each barrel is heated and quenched. Then each barrel is rotated to place the lug in position within the heater coil, and the operation is repeated. The same procedure is followed to harden the third lug. This one heater, and one operator, perform the hardening operations on 125 bazookas per hour.

NO. 9 IN A SERIES OF CASE STUDIES ON THE ACCOMPLISHMENTS OF G-E ELECTRONIC HEATERS

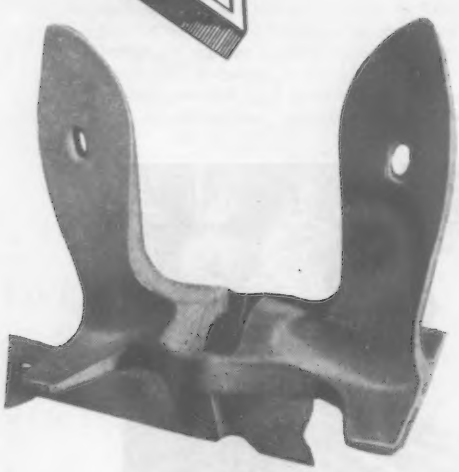
GENERAL ELECTRIC

ELECTRONIC HEATERS

Buy all the BONDS you can—
and keep all you buy

MODERN FACILITIES
TO MAKE BIRDSBORO PRECISION STEEL CASTINGS

ONE OF THE FIVE BAYS IN THE BIRDSBORO FOUNDRY



Birdsboro precision steel castings are made by the Randupson Process in giant bays, like the one above, with experienced care that assures uniform, true-to-pattern castings. Birdsboro's steel casting department has been serving many industries and successfully meeting their most rigid standards of specifications.

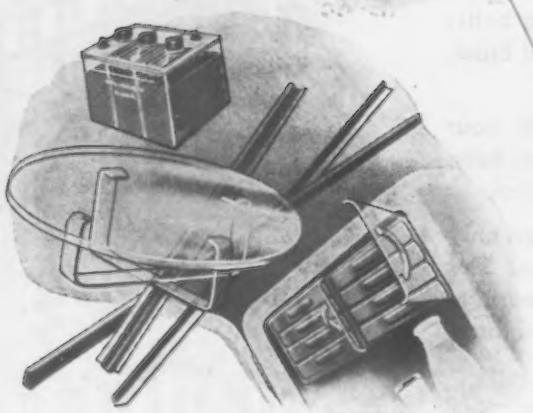
Put this modern casting experience to work on your casting problems. Our engineers will be glad to sit down with you and discuss your particular requirements. Call Birdsboro today or write us at the foundry.

BUY WAR BONDS

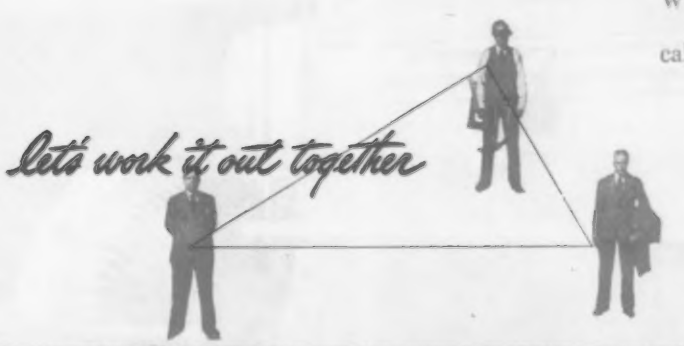
BIRDSBORO
PRECISION CASTINGS
MADE BY RANDUPSON PROCESS

BIRDSBORO STEEL FOUNDRY AND MACHINE CO. · BIRDSBORO, PA.

Why a comb is big plastics news



Most of us take a comb more or less for granted. But to the plastics industry, *this* comb is different. Made of the No. 1 postwar plastic—Styron (Dow Polystyrene)—it is the "measuring stick" for plastics in respect to appearance, quality, price and moldability. There are a number of reasons for this leadership. First, Styron comes from the only privately owned synthetic styrene plant with sufficient facilities to care for molders' postwar requirements. This means availability—and it means an attractive price; add to these advantages Styron's long recognized superior physical properties, and the list of potential uses becomes almost unlimited. Why not find out how Styron fits into *your* postwar plans?



We at Dow know from experience that success in plastics is not a one-man nor even a one-industry job. It calls for the combined skill and cooperation of manufacturer or designer plus fabricator plus raw materials producer. Working together, this team saves time and money and puts plastics to work successfully. Call us—we'll do our part.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

New York, Boston, Philadelphia, Washington, Cleveland, Detroit
Chicago, St. Louis, Houston, San Francisco, Los Angeles, Seattle

PRESENT AND POTENTIAL USES—Lighting fixtures and displays; insulators; hydrometers; battery cases; funnels; bottles; closures; food handling equipment; pharmaceutical, cosmetic, and jewelry containers; jewelry; advertising items; refrigerator parts; pens; pencils; chemical apparatus; lenses; decorative objects and trim.

PROPERTIES AND ADVANTAGES—Beautiful, clear, translucent; "pipes" light through rod around corners, etc.; resistant to acids and many alkalies; stable at low temperatures; excellent electrical properties; broad color range; low specific gravity providing more moldings per pound; low water absorption.

STYRON

(DOW POLYSTYRENE

DOW

PLASTICS

STYRON • ETHOCEL • ETHOCEL SHEETING • STYRALOY
SARAN • SARAN FILM • STRIPCOAT

Star Performance at Lone Star Gas

HERE'S a typical example of how a big modern office building or any commercial or industrial plant can obtain dependable, low-cost power with Cooper-Bessemer diesels and gas engines.

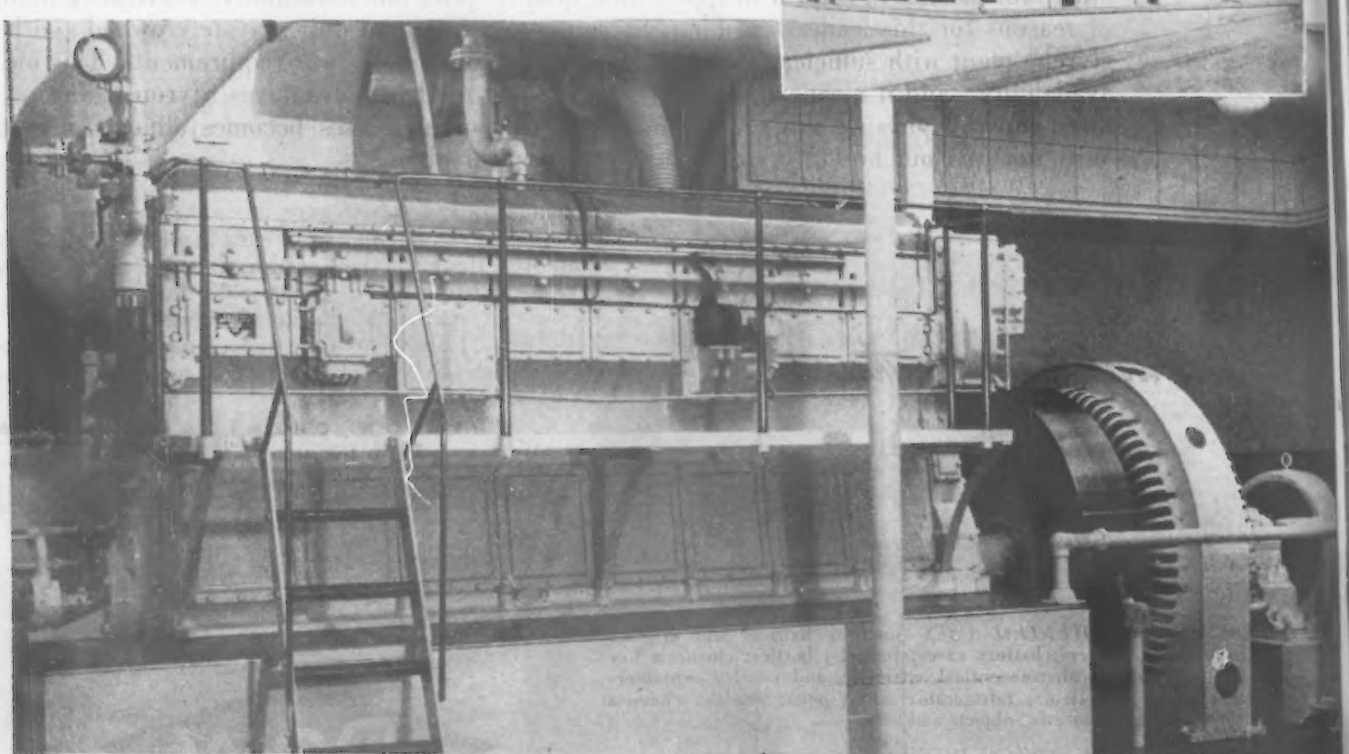
Seven years ago Lone Star Gas Company installed this 400 horsepower, eight-cylinder, Type GNG, gas engine in their large Wood Street Building in Dallas, Texas. The engine furnishes electricity for the light and power load, including elevators.

After seven years the engine "seems to be running better and better all the time," says Mr. W. F. Gieb, Chief Building Engineer.

Fuel consumption has averaged 16.5 cu. ft. per KW hour with a load factor of 66.5. Lube oil consumption has been at a rate of 4,075 rated horse-power hours per gallon.

The engine has been overhauled twice, but required only spark plug adjustment and grinding of valves. The original rings are still in good condition, and bearings have required no adjustment. During one period of three years the crankcase was never opened.

If you are interested in trouble-free, long-lived power units like this for present or post war power requirements, we are ready to work with you. Engines ordered now will be delivered shortly after war restrictions are relaxed.



The Cooper-Bessemer Corporation

Mount Vernon, Ohio Grove City, Penna.

New York · Washington · Tulsa · Dallas · St. Louis · Houston · Los Angeles · Seattle · Shreveport

with ALCOA impact extrusions

One wallop of the impact extrusion press, and see what you have—a "shell" four inches tall—that part with ears attached—or the giant cylinder. Here's high speed, low cost production at its best.

Millions like the little fellow have been produced by Alcoa for such uses as radio condenser cans and blood transfusion set containers. But war's demands for more output with less labor early recognized the potentials of the process. Alcoa answered with parts like these.

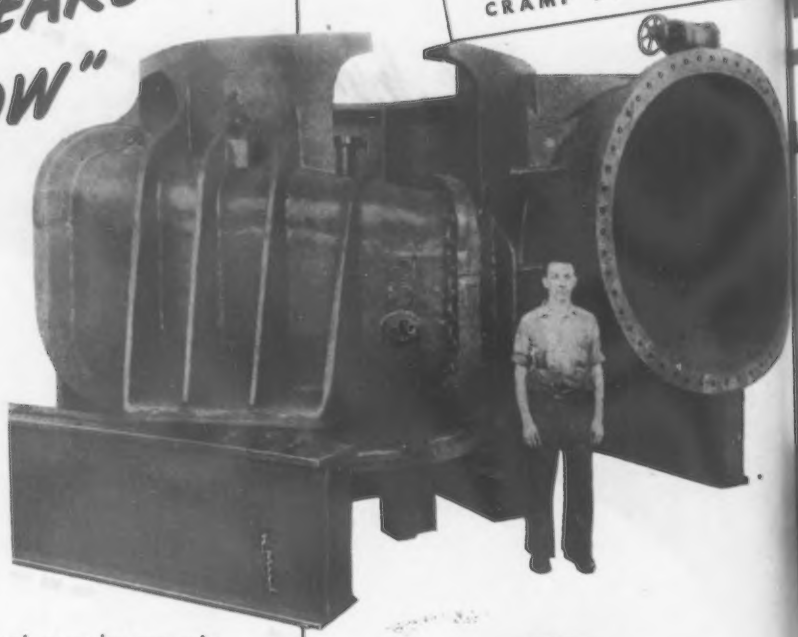
Only aluminum gives you so much to start with—parts so quickly brought to finished form. Only aluminum offers you the combination of lightness, resistance to corrosion, workability and fine appearance. Alcoa has the know-how to help you use aluminum and the impact extrusion process to best advantage. ALUMINUM COMPANY OF AMERICA, 2185 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM

THERE'S 117 YEARS OF "KNOW-HOW"

behind complicated castings like this one

PRODUCT OF CRAMP DIVISION

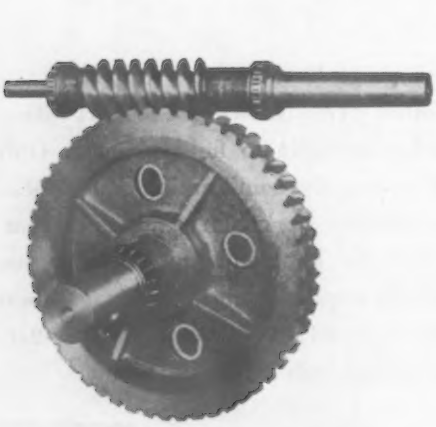


To produce a good casting the pattern has to be sized to take care of the contraction of the metal when it sets. The mold has to be gated so the recesses will be filled, and reinforced to avoid any "flood damage." The metal must be expertly poured at exact temperatures, to assure a strong, sound casting with the exact properties required.

All this calls for a degree of skill in the pattern shop, the molding department, and the casting floor, plus complete coordination of the work of all three, that can come only from years of experience. And Baldwin's experience goes back over a century!

Whenever you need castings that must be *right*, Baldwin is the logical place to get them. To get an idea of the variety of work that is handled, and the ferrous and non-ferrous alloys available, ask for the Cramp Catalog No. 194. The Baldwin Locomotive Works, Cramp Brass & Iron Foundries Division. Offices: Philadelphia, New York, Washington, Boston, Chicago, Cleveland, St. Louis, Detroit, San Francisco, Houston, Pittsburgh.

SPECIAL PROPERTIES ALLOYS TO MEET CORROSIVE CONDITIONS. Cramp Division regularly produces over 30 non-ferrous alloys, offering a wide range of physical properties, and resistive to a variety of corrosive conditions. The pump runner illustrated is P.M.G. metal—a very versatile material. See catalog for specific service data.



"SUPERSTRENGTH" BRONZE WORM GEARS. "Superstrength" has tensile strengths ranging over 100,000 lbs./sq. in., combined with unusual ductility and hardness. It is recommended for any slow speed service involving heavy pressures and shock, such as steel mill gears, screw-down nuts, pressure blocks, and similar applications. Physicals are listed in the catalog.

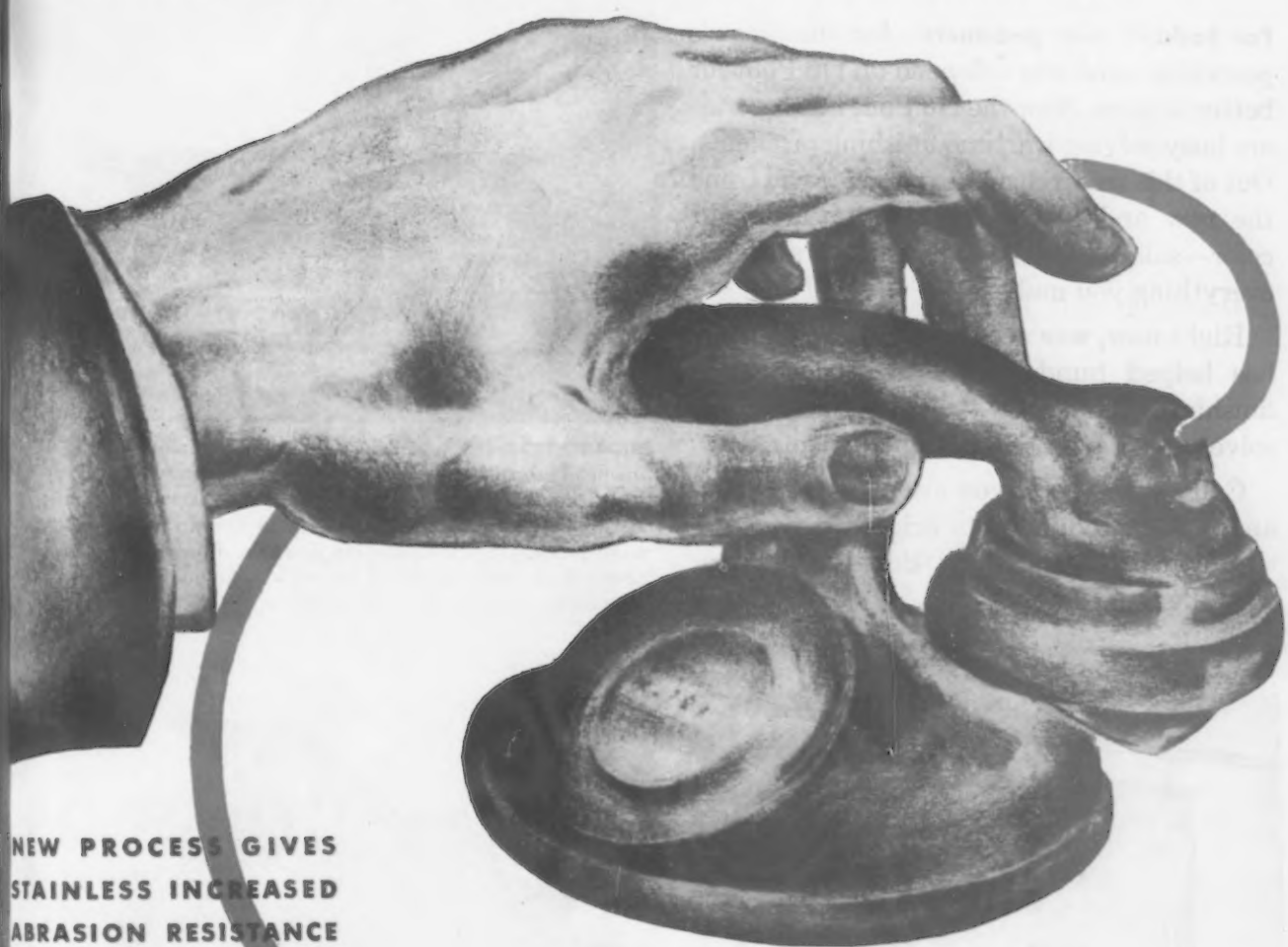
"HIGH-SPEED" BABBITT METALS. The design of modern high-speed machinery generally involves a thin-section babbitt bearing, and this calls for something special in properties. Our Parsons White Brass DA was developed specifically for this use. You'll find it in the catalog.

BLW THE BALDWIN GROUP **BALDWIN**

FERROUS & NON-FERROUS CASTINGS

WITHIN YOUR REACH!

LARGEST, MOST DIVERSIFIED WAREHOUSE STOCK OF STAINLESS STEELS IN AMERICA!



NEW PROCESS GIVES STAINLESS INCREASED ABRASION RESISTANCE

This efficient new process combines the corrosion resistance of Stainless with the abrasion resistance of a nitrided surface. Both austenitic and martensitic grades of Stainless now can be hardened.

Stainless Surface Hardening Company, 255 Bent Street, Cambridge 41, Mass. —a subsidiary of Industrial Steels, Inc.

JMLco C1-F1

LET ONE CALL DO IT ALL WHEN YOU NEED STAINLESS STEELS!

Telephone Industrial first . . . then receive *all* your requirements from the largest, most diversified warehouse stock of Stainless Steels in America. Industrial's huge inventory includes scores of different items in Stainless — that's why *same-day* attention to your order is assured. What's more, you are charged *no premium over mill prices.* Remember . . . if its Stainless, Industrial has it. And don't hesitate to call on Industrial's expert metallurgists if you have a problem concerning Stainless. Free catalog sent on request. Industrial Steels, Inc., 250 Bent Street, Cambridge 41, Mass. TROwbridge 7000.

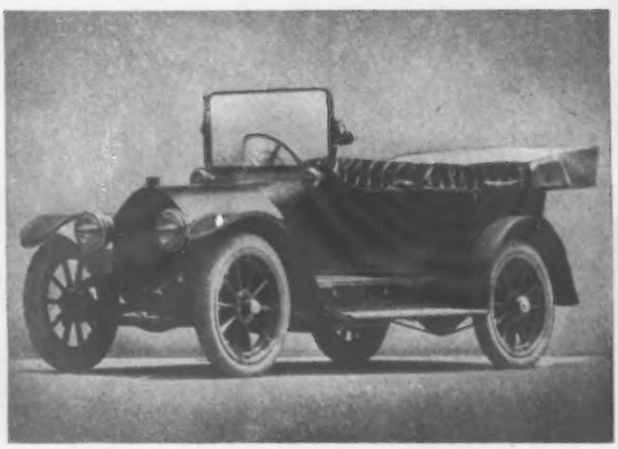
Everything in STAINLESS **INDUSTRIAL STEELS, INC.**

SEE DU PONT FIRST FOR TOMORROW'S BETTER FINISHES

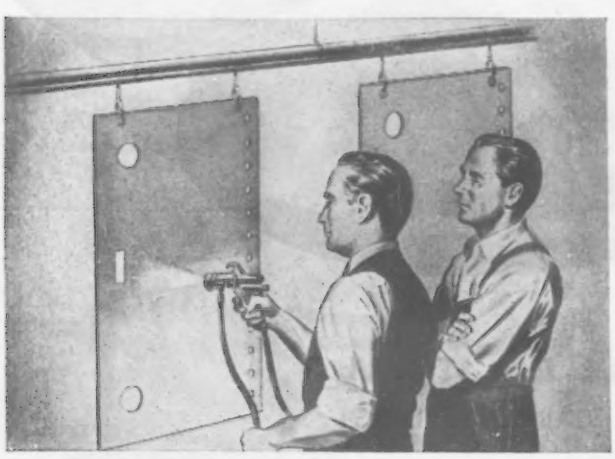
For today's war products—for tomorrow's peacetime products—depend on Du Pont for better finishes. Now the Du Pont laboratories are busy solving wartime finishing problems. Out of this research and experience will come the new and better finishes that will add color—sales appeal—durability—value—to everything you make.

Right now, war needs come first. Du Pont has helped hundreds of industries break finishing bottlenecks—will be glad to help solve your wartime finishing problems.

Call on us, too, if you are planning a new and better product for a brighter tomorrow—provided, of course, it doesn't interfere with the war effort.



PRIOR TO 1923, it took 21 days to apply the slow-drying finishes before this four-cylinder powerhouse was ready for market. Then Du Pont perfected DUCO, slashing costs, cutting finishing time from weeks to hours, helping to make production-line finishing possible. From the same laboratories that produced DUCO will come the better finishes for your product of tomorrow.



IMPROVED FINISHING TECHNIQUES—For example, a war contractor of metal panels called in a Du Pont Service Engineer when finishing costs hit 50 per cent above estimate. Spray-gun operators were instructed in new technique of applying finish. Results: Finishing materials saved, rejects minimized, costs brought within estimate. Can you use this experience today?

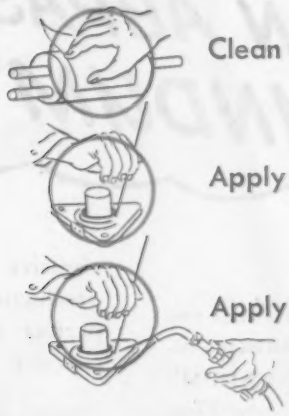
ENHANCING AND PROTECTING beautiful wood veneers is made-to-order for DUCO or DULUX. Furniture identified with a Du Pont DUCO or DULUX finish has sure-fire sales appeal, instant consumer recognition. Put Du Pont "know how" to work on your product by writing to: E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.

DEPEND ON DU PONT FOR BETTER FINISHES

® REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

WITH PHOS-COPPER YOU MERELY:



Clean the metal

Apply Phos-Copper

Apply heat

WILL THIS QUICK METHOD SIMPLIFY YOUR PROCESSES?

OR SAVE YOU MONEY?

In a few seconds, the gas torch and Phos-Copper have made a strong leakproof joint between the diaphragm and the copper flange assembly. The process is simplicity itself.

You're sure of strength greater than the parent metal . . . corrosion resistance equaling the parent metal . . . electrical conductivity 98% as great—when you use Phos-Copper to braze copper, brass and bronze.

And you are following a well-defined trend if you check again carefully on your manufacturing processes to see if a built-up structure joined by brazing can replace a complicated machining or casting job. Brazing is simple, speedy, sure.

This is particularly true with Phos-Copper since it offers the added advantages of low melting point, excellent capillary action, absolute uniformity, high fatigue resistance and lower first cost . . . advantages which make it superior to tin and silver base solders.

Phos-Copper brazing may be done in any of five ways—by gas, incandescent carbon, dipping and electronic heat, and in a furnace. It comes in rod, strip and special shapes.

For added information on Phos-Copper, ask your Westinghouse representative for Book B-3201. Or write for a copy, to Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-90554

Westinghouse

PLANTS IN 25 CITIES . OFFICES EVERYWHERE

Phos-Copper Brazing

IF IT'S AN ABRASIVE TOOL . . . "CARBORUNDUM" MAKES IT!

EVERY once in a while, somebody tells us that the reason he's not using an Abrasive by "CARBORUNDUM" on a particular job is because "CARBORUNDUM" doesn't make an abrasive product for that job. That always surprises us. For actually there's an abrasive product by "CARBORUNDUM" for all abrasive applications used by modern industry. You see, The Carborundum Company pioneered the use of man-made abrasives. For over half a century, "CARBORUNDUM" abrasive engineers have been working with tool and production engineers and others in industry to help perfect better ways of doing things through the effective use of abrasive tools.

Today, Abrasives by "CARBORUNDUM" are used in almost every industry and for a multitude of purposes. Many users specify these products for all their requirements. Whenever you need help with your abrasive problem call the "CARBORUNDUM" representative. The Carborundum Company, Niagara Falls, N. Y.

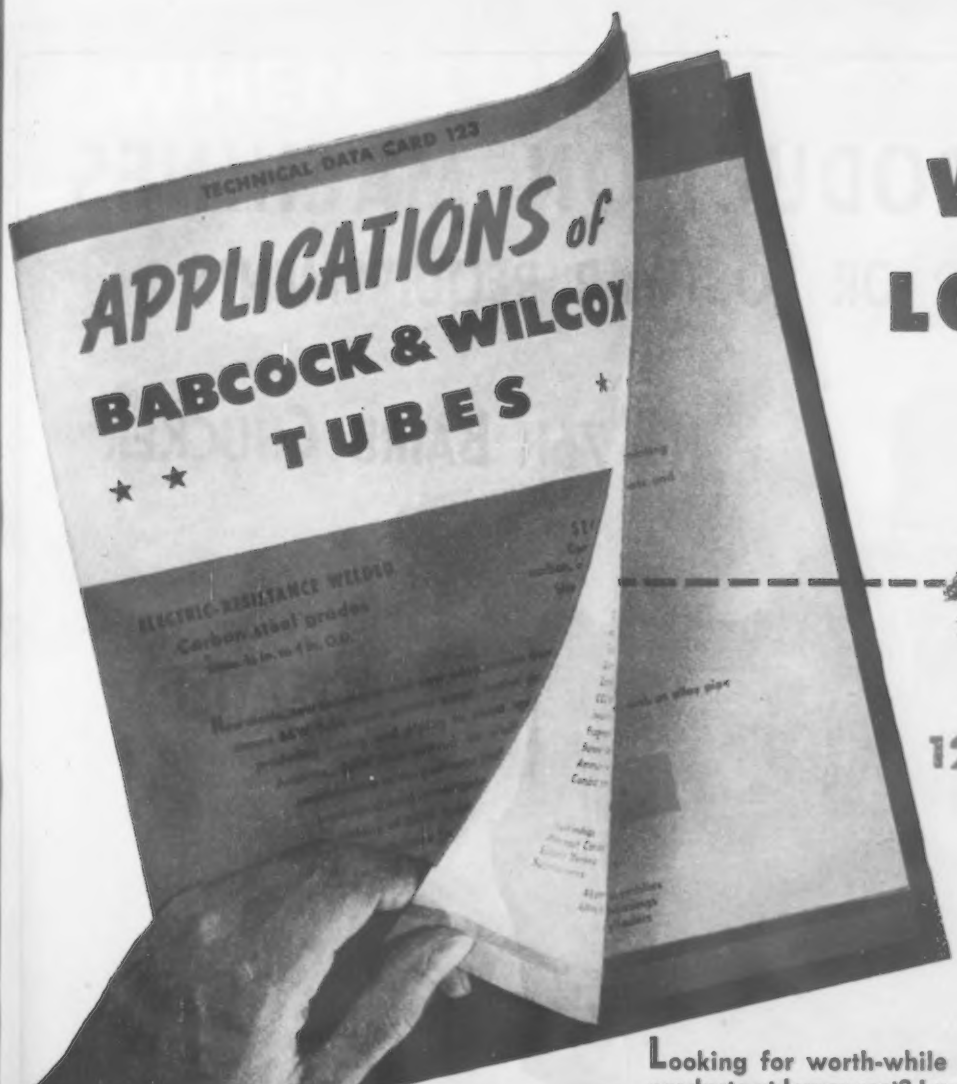
THERE IS A PRODUCT BY

CARBORUNDUM

TRADE MARK

FOR EVERY ABRASIVE APPLICATION

("CARBORUNDUM" is a registered trade mark of and indicates manufacture by The Carborundum Company)



WORTH LOOKING INTO

120 Present Uses that suggest Future Savings

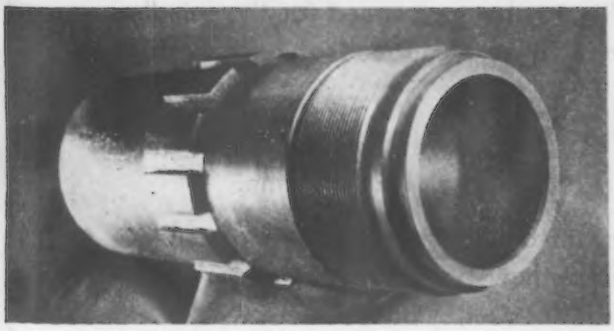
Looking for worth-while shortcuts to better peacetime products at lower cost? Investigate the many applications of B&W Tubes made possible through new steels, new techniques, and new adaptations of seamless and welded tubing demanded by the war effort.

For instance, many products and parts, once made from costly-to-handle bar stock, are now being made faster and cheaper from dimensionally accurate, easily-machined B&W seamless tubing.

B&W seamless tubes are made in a complete wide range of carbon and alloy steels including stainless—both straight chromium types of the ferritic group and those austenitic alloys from Type 304 up to Type 347. Sizes range from ½ inch to 8⅝ inch O.D.

B&W electric-resistance welded tubes are produced in carbon grades, in sizes ranging from ¾ inch to 4 inch O.D.

Just off the press is an up-to-date list of 120 proved uses of B&W Tubes. It may suggest new ways in which B&W Tubing can help you in meeting postwar competition with better products more economically produced. Write for folder "Applications of Babcock & Wilcox Tubes".



B&W MAKES BOTH

B&W TUBES

SEAMLESS. Complete range of carbon alloy and stainless steels
Sizes: ½ in. to 8⅝ in. O.D.
ELECTRIC-Resistance Welded Carbon grades
Sizes: ¾ in. to 4 in. O.D.

THE BABCOCK & WILCOX TUBE COMPANY

Seamless Tube Division — BEAVER FALLS, PA.
Welded Tube Division — ALLIANCE, OHIO

TA-1330

HIGH PRODUCTION MACHINES

FOR WAR OR POSTWAR REQUIREMENTS

No. 76H BAIRD CHUCKER

AUTOMATIC MACHINERY
BAIRD
STRATFORD CONNECTICUT U.S.A.

This pictures the BAIRD 7" Six Spindle Horizontal Automatic Lathe which has become outstanding because of its fine degree of accuracy and its exclusive features as

INDEPENDENT TOOL SLIDES. The longitudinal tool slides may have different strokes adding flexibility for varied tooling. Cross slides also are independent. All tool slides have micrometer adjustment.

DIFFERENT SPEEDS AT SPINDLES. Ability to choose a speed for the spindle at each work station to suit the operation to be performed at that station permits of best product in least time.

AUTOMATIC CHUCKING. Operator has both hands free to handle the work. No levers or handles to require his attention or take his time.

ATTACHMENTS. Several readily applied attachments are available to perform extra operations and reduce handling, thus speeding production.

"Ask BAIRD *About It"*

THE BAIRD MACHINE COMPANY, STRATFORD 9, CONN.

WHEN YOU NEED STEEL . . .

UNITED STATES STEEL SUPPLY COMPANY
USS
STEELS
SERVICE

—for Quick Service!

STOCKS in our warehouses today are larger and we have a wide variety of steels available for quick shipment. These stocks include all standard grades and sizes of U·S·S Stainless Steels, and a complete line of Carbon Steel Products. Our service has helped many plants to continue uninterrupted production, so when you need steel quickly, get in touch with our nearest warehouse. We will continue to exert our best efforts to deliver your orders without delay.

All orders and inquiries receive courteous attention and quick action.

UNITED STATES STEEL SUPPLY COMPANY

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BALTIMORE (3) Bush & Wicomico Sts., P. O. Box 2036—GILmore 3100
BOSTON (34) 176 Lincoln St., Allston, P. O. Box 42 STAdium 9400
CLEVELAND (14) 1394 E. 39th St., HEnderson 5750
MILWAUKEE (1) 4027 West Scott St., P. O. Box 2045—Mitchell 7500
NEWARK (1), N. J. Foot of Bessemer St., P. O. Box 479—Bigelow 3-5920 REctor 2-6560, BErgen 3-1614
PITTSBURGH (12) 1281 Reedsdale St., N. S. CEdar 7780
ST. LOUIS (3) 21st & Gratiot Sts., P. O. Box 27 MAin 5235
TWIN CITY 2545 University Ave., St. Paul (4), Minn. NEstor 2821

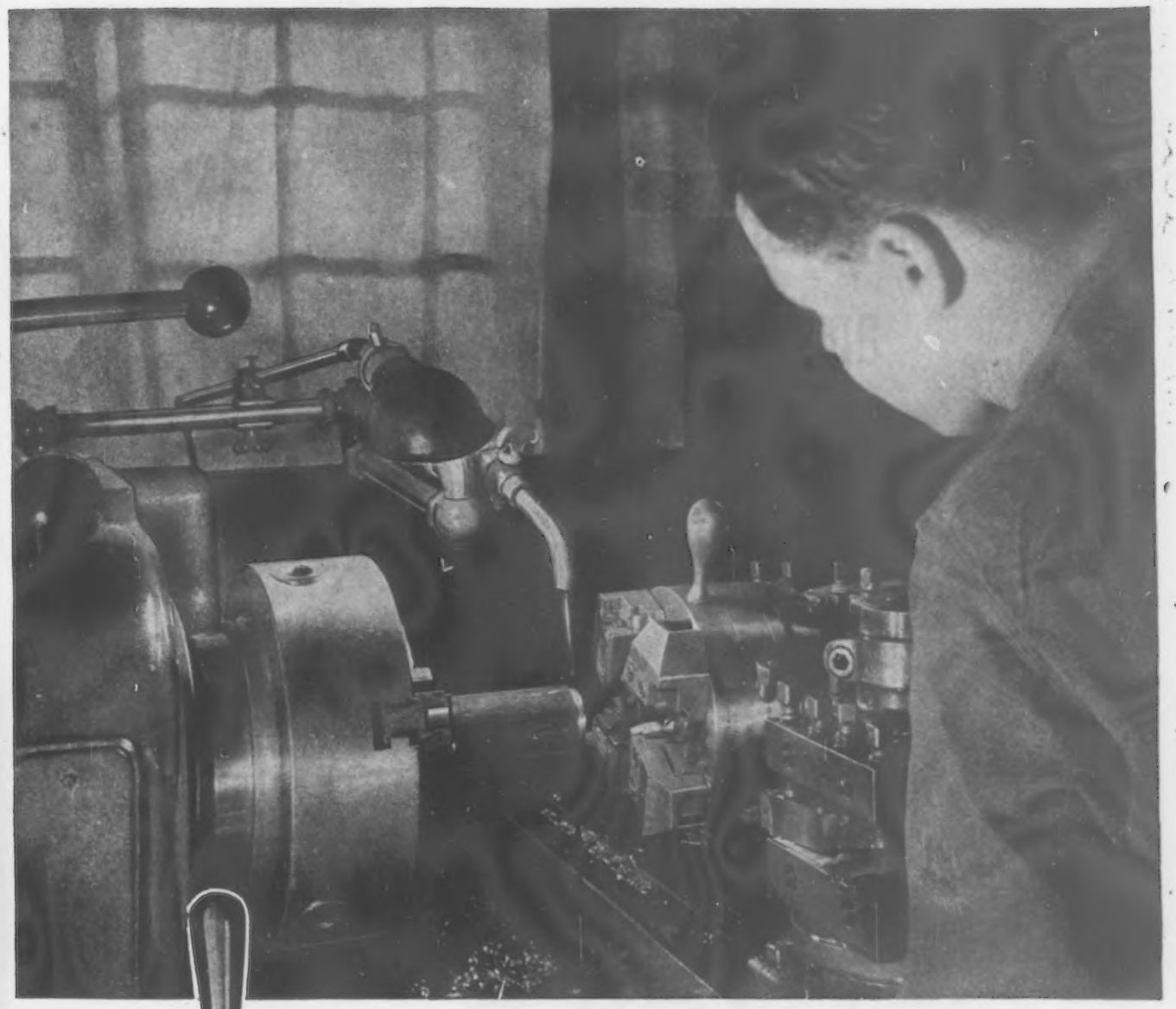
UNITED STATES STEEL

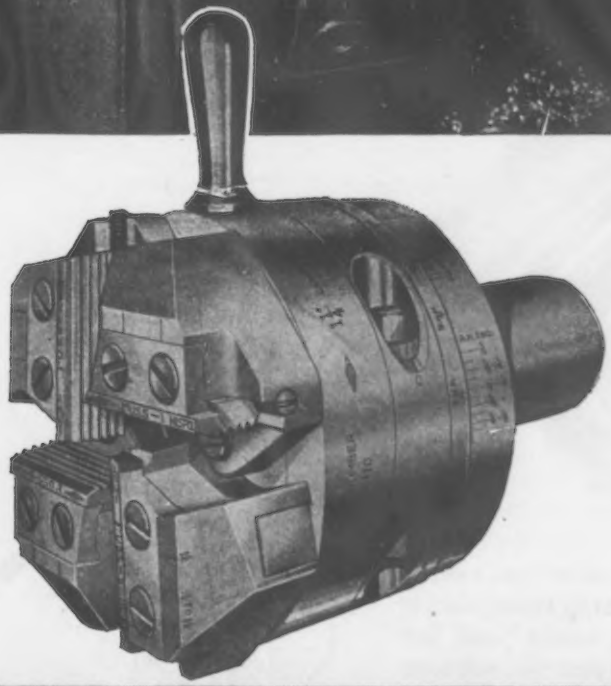
For Turret Lathe and Hand Screw Machine Operations - the

LANDMATIC HEAT TREATED DIE HEADS ARE UNIVERSALLY USED

The Landmatic Head is designed especially for use on turret lathes and hand screw machines. Its sturdy rigid construction assures high operating efficiency and fine thread accuracy.

LANDIS





An eastern manufacturer of Gas, Steam, Air and Water Valves employs Landmatic Heads exclusively for threading Seat Rings and other valve components. Threads ranging in size from 1½ inches to 5 inches in diameter are cut with Landmatic Heat Treated Die Heads with an average saving of 30% of the cost of methods previously used. In the words of the manufacturer, "Figures definitely prove that Landmatic Heads are doing a BETTER job for us." Perhaps they may likewise do a better job on YOUR Turret Lathe Threading Operations.

Write for Bulletin F-90

MACHINE CO. WAYNESBORO PENNA. U.S.A.

single-file non-stop anneal

more about "heat-treatment-on-the-fly"

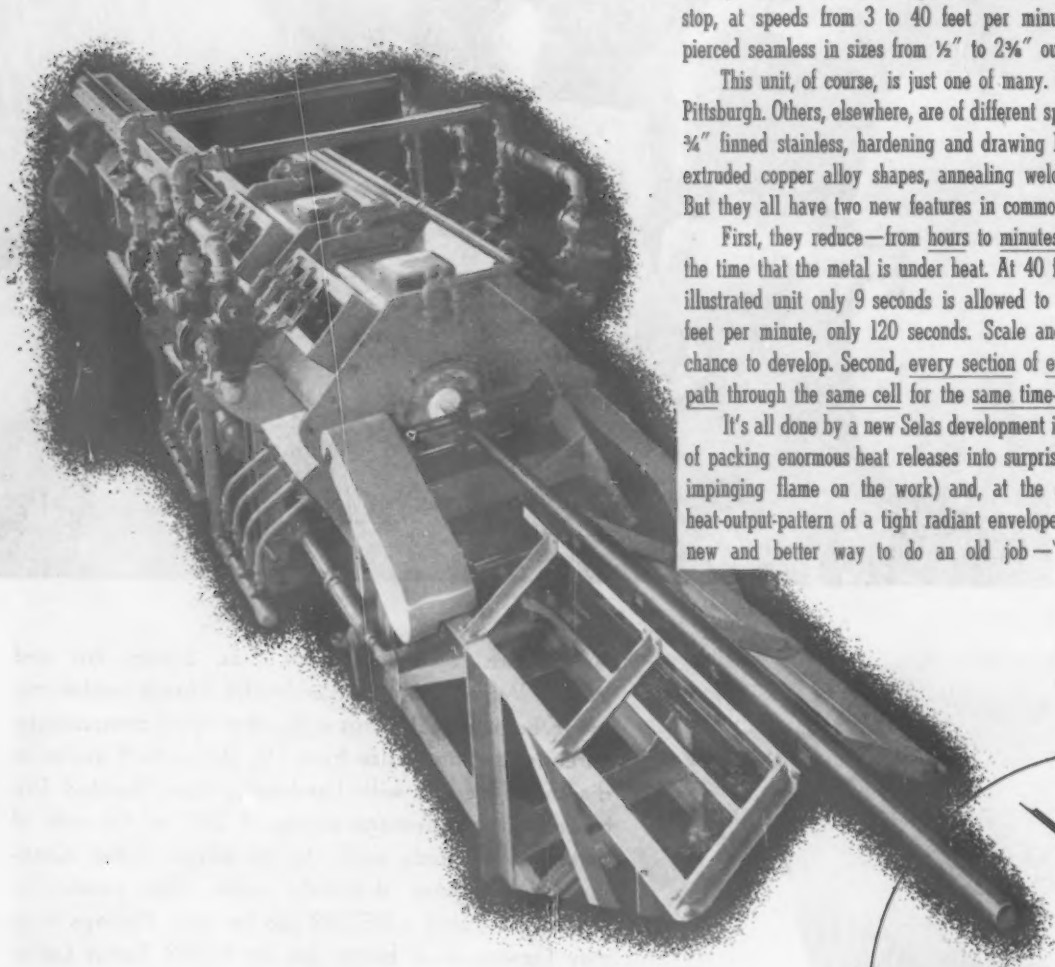
. . . 1400 lbs. of seamless per hour through a gas-fired-cell only 6 feet long

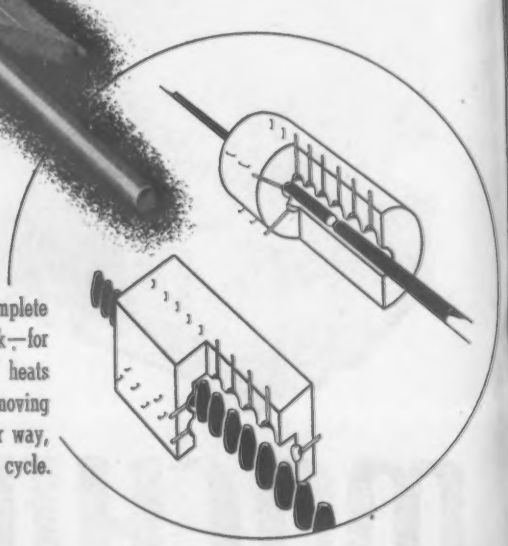
Look at what's happened to the tube annealing furnace! It has shrunk to a "cell" only 6 feet long—with a 2800-degree "hell-hole" only 7 inches in diameter through its center. It heat treats its production "on the fly"—while the tube lengths follow one another, single-file and non-stop, at speeds from 3 to 40 feet per minute. It handles heavy-wall pierced seamless in sizes from ½" to 2¾" outside diameter.

This unit, of course, is just one of many. It's at work in a mill near Pittsburgh. Others, elsewhere, are of different specification—for processing ¾" finned stainless, hardening and drawing 1" steel shafting, softening extruded copper alloy shapes, annealing welded tube up to 3½" large. But they all have two new features in common.

First, they reduce—from hours to minutes and minutes to seconds—the time that the metal is under heat. At 40 feet per minute through the illustrated unit only 9 seconds is allowed to attain 1950 degrees—at 3 feet per minute, only 120 seconds. Scale and decarb don't have much chance to develop. Second, every section of every tube follows the same path through the same cell for the same time-temperature treatment.

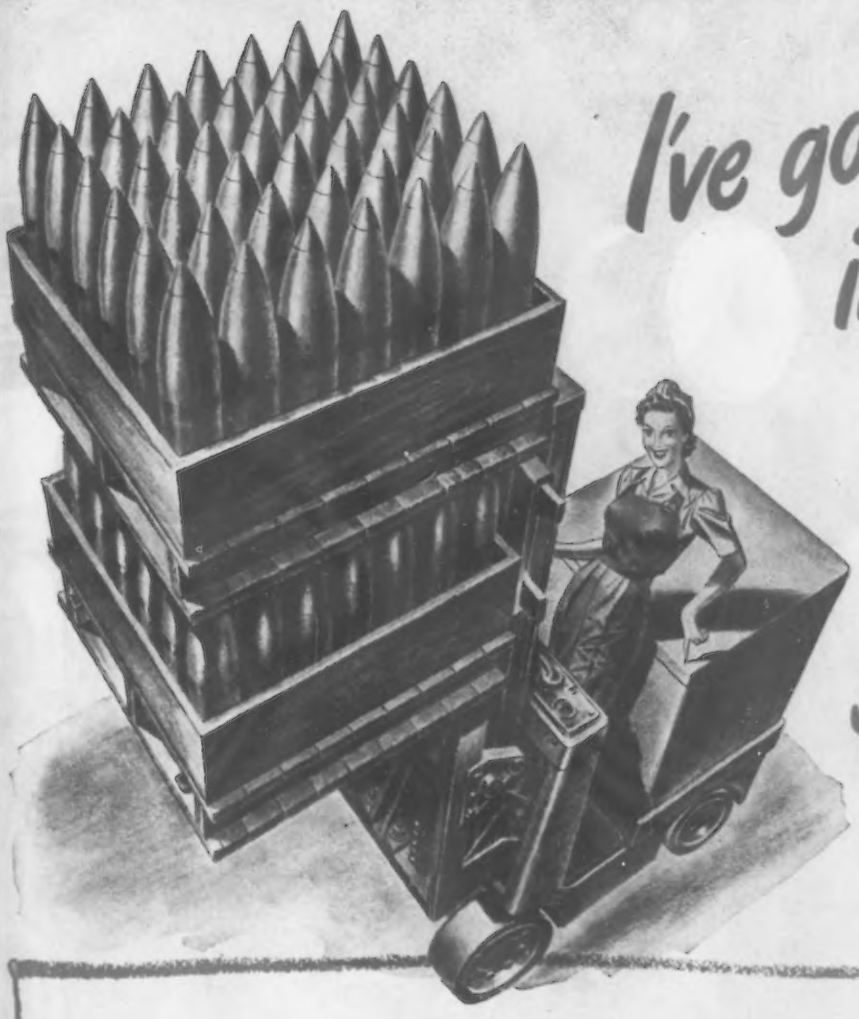
It's all done by a new Selas development in gas combustion—a means of packing enormous heat releases into surprisingly small spaces (without impinging flame on the work) and, at the same time, controlling the heat-output-pattern of a tight radiant envelope about the work. Hence, a new and better way to do an old job—"heat-treatment-on-the-fly".





THE GEOMETRY VARIES WITH THE JOB . . . for tubes or rods or shapes, a complete circle of burners is "wrapped" around the traveling work—for parts or pieces in conveyor parade, a radiant "tunnel" heats from both top and sides (and the work-pieces rotate while moving forward). Either way, it's single-file and non-stop. Either way, burner patterns and sizing control the time-temperature cycle.

SELAS CORPORATION OF AMERICA PHILA 34 PA



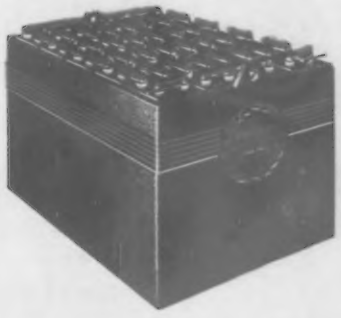
I've got a Philco in here...

a Philco "Thirty"—the Electric Truck Battery with

30% Longer Life!

FOR 50 YEARS PHILCO HAS BEEN A LEADER IN INDUSTRIAL BATTERY ENGINEERING

To operators of electric industrial trucks a PHILCO has long meant a big storage battery that provides the power to move great pallet loads of materials. For more than 50 years, important developments in storage battery design have come from Philco engineers. The latest of these is this revolutionary new Philco "Thirty", with 30% longer life! It's the toughest battery ever built for heavy industrial motive power service. Its far longer life is news of the utmost importance for all who seek lower costs in materials handling, today and after the war. There's a Philco Storage Battery for every need in industry—mine haulage, railway service, oil switch control, telephone service, and many others. Write for latest catalogs.



In the new Philco "Thirty" Storage Battery, a revolutionary new construction principle employing fabricated glass tape insulation, greatly increases the life of the power-producing positive plates. Only Philco "Thirty" has this great new development which adds 30% and MORE to Storage Battery life.

FOR THE LATEST IN MODERN BATTERY DESIGN... SPECIFY

PHILCO Storage Batteries

PHILCO CORPORATION • STORAGE BATTERY DIVISION • TRENTON 7, NEW JERSEY

COPYRIGHT 1945, JONES & LAUGHLIN STEEL CORP.

FROM AN ORIGINAL DRAWING AND SKETCHES MADE AT J&L WIRE ROPE PLANT AT MUNCY PENNSYLVANIA

End-weld Studs Automatically!

Nelson studs are end-welded to metal. No drilling holes... no welding bolts.

Used by more than 500 shipbuilding and industrial plants.

Complete fusion between stud and plate in less than ½ second!

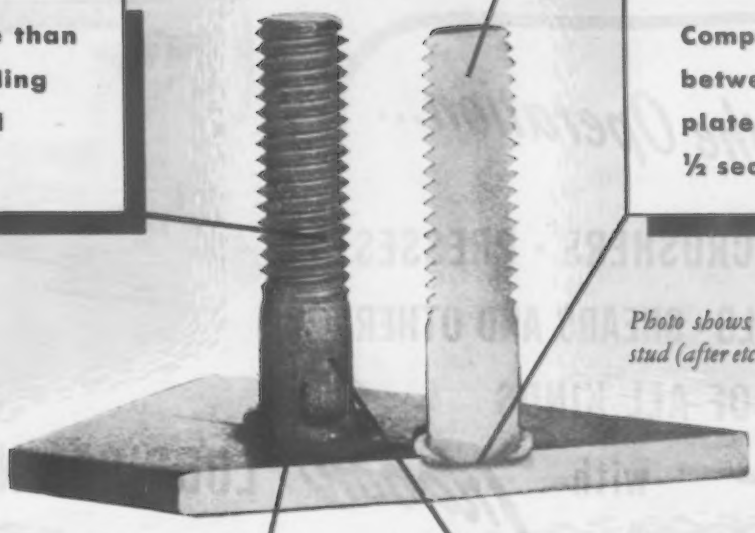


Photo shows cutaway view of stud (after etching with Nital).

Operators can weld 500 to 1000 studs a shift. Completely automatic operation.

Many diameters, lengths, and types, for securing parts of all kinds.

The Model "H" Arc Stud Welder

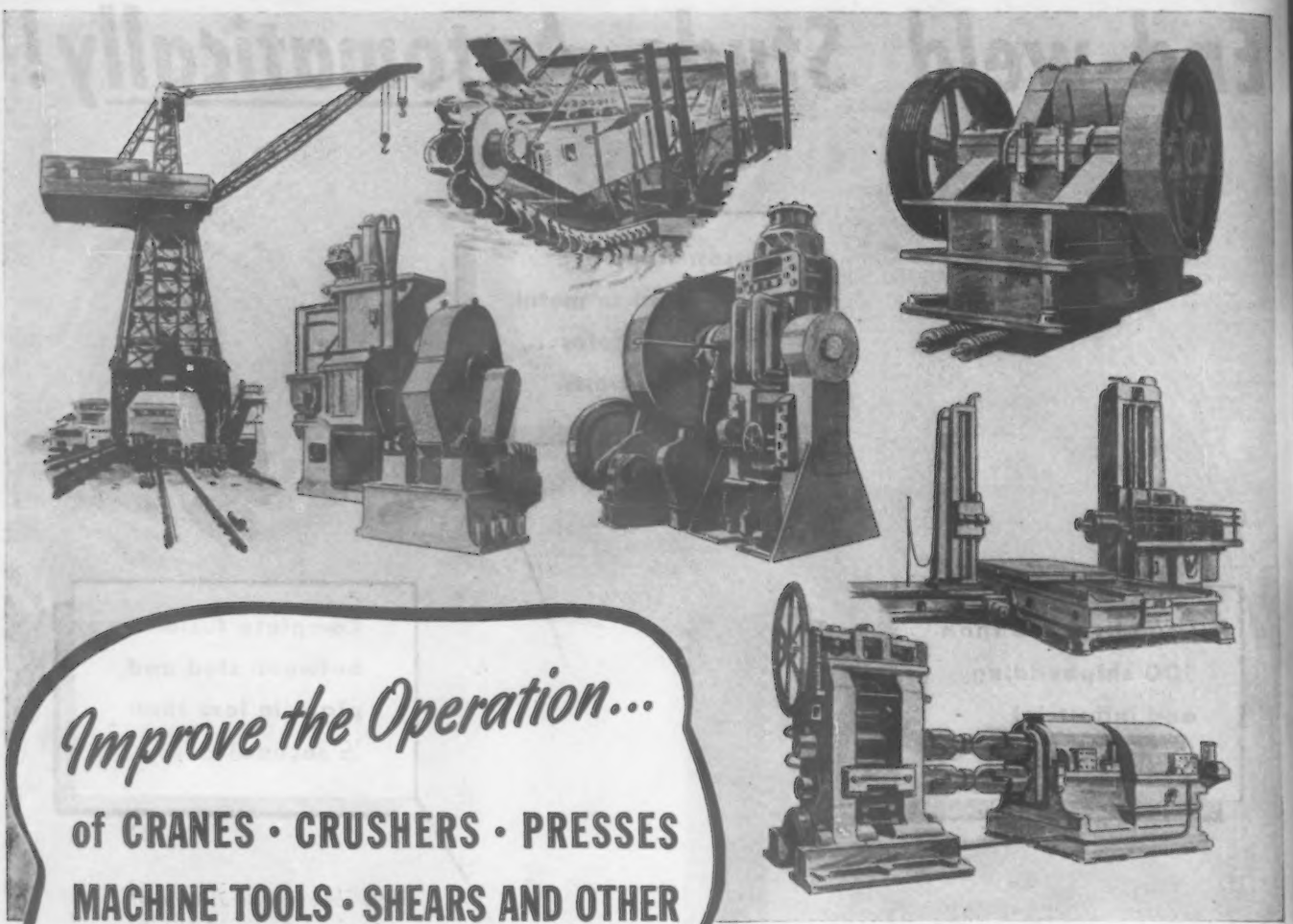
For complete details and catalog, write:

NELSON SPECIALTY WELDING EQUIPMENT CORPORATION

Dept. I, 440 Peralta Ave., San Leandro, Calif.

Eastern Representative: Camden Stud Welding Corp. Dept. 122, 1416 So. Sixth St., Camden, N. J.

NELSON STUD WELDERS & STUDS



Improve the Operation...

of CRANES • CRUSHERS • PRESSES MACHINE TOOLS • SHEARS AND OTHER MACHINERY OF ALL KINDS

with *Trabon* LUBRICATING SYSTEMS

● Prolong bearing life,– reduce accidents and compensation costs, and get a maximum of long, efficient, trouble-free operation, by equipping your machines with Trabon Lubricating Systems.

Service-proved for years on all kinds of machinery, under all kinds of conditions, Trabon Lubricating Systems eliminate costly downtime while a man crawls around lubricating each bearing individually. Trabon Systems make absolutely certain that every bearing, whether large or small, easy or difficult to reach, receives just the desired amount of lubricant, at just the desired frequency, –while the machine is in operation.

Let Trabon engineers with their long and successful experience in this work show you how a Trabon Lubricating System, individually engineered to the requirements of your own particular and individual job, will increase your production, and cut your costs. Fully descriptive engineering bulletin sent on request. Simply tell us the kind of machine you wish to lubricate. Trabon Engineering Corp., 1817 E. 40th St., Cleveland 3, Ohio.

Trabon LUBRICATING SYSTEMS

. . . for Machines and Machinery of all kinds

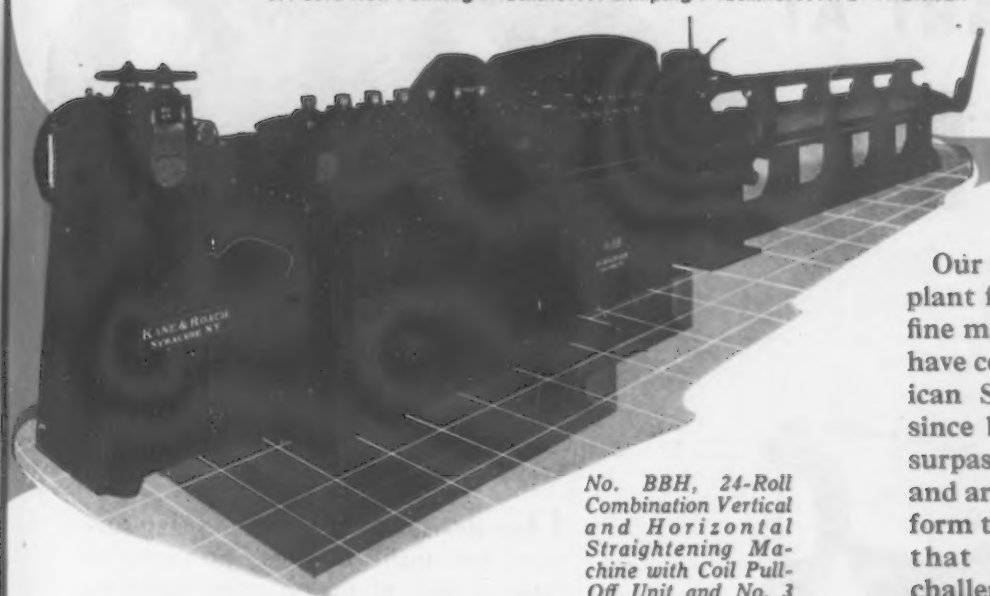
ORIGINATORS AND PATENT OWNERS OF THE SINGLE LINE REVERSING LUBRICATING SYSTEM

Get Out the Work!"

...A Wartime Challenge We're Answering with NEW ACHIEVEMENTS

KANE & ROACH

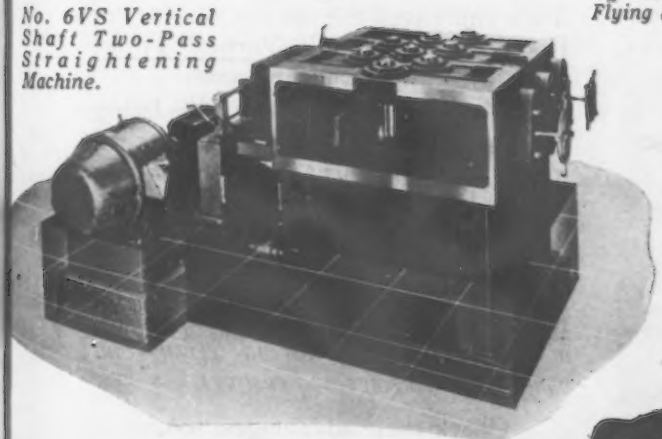
Manufacturers since 1887 of Straightening Rolls... Bending Rolls... Edging Rolls... Gang Slitters ... Cold Roll Forming Machines... Crimping Machines... War Materials — Sub-Contracting



No. BBH, 24-Roll Combination Vertical and Horizontal Straightening Machine with Coil Pull-Off Unit and No. 3 Flying Shear.

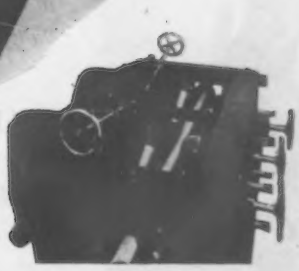
Our skilled workers . . . our unique plant facilities . . . our knowledge of fine machining . . . which since 1887 have contributed much to the American Steel Industry—all have long since been called to arms. We have surpassed all our previous records... and are now doing our utmost to perform the biggest job in K&R history, that of answering our nation's challenge for *more*, and then *some MORE*, material for our armed forces.

No. 6VS Vertical Shaft Two-Pass Straightening Machine.



No. 5 Leveler and Cut-Off.

No. 2AH, 24-Roll Combination Horizontal and Vertical Straightening Machine, Type A.

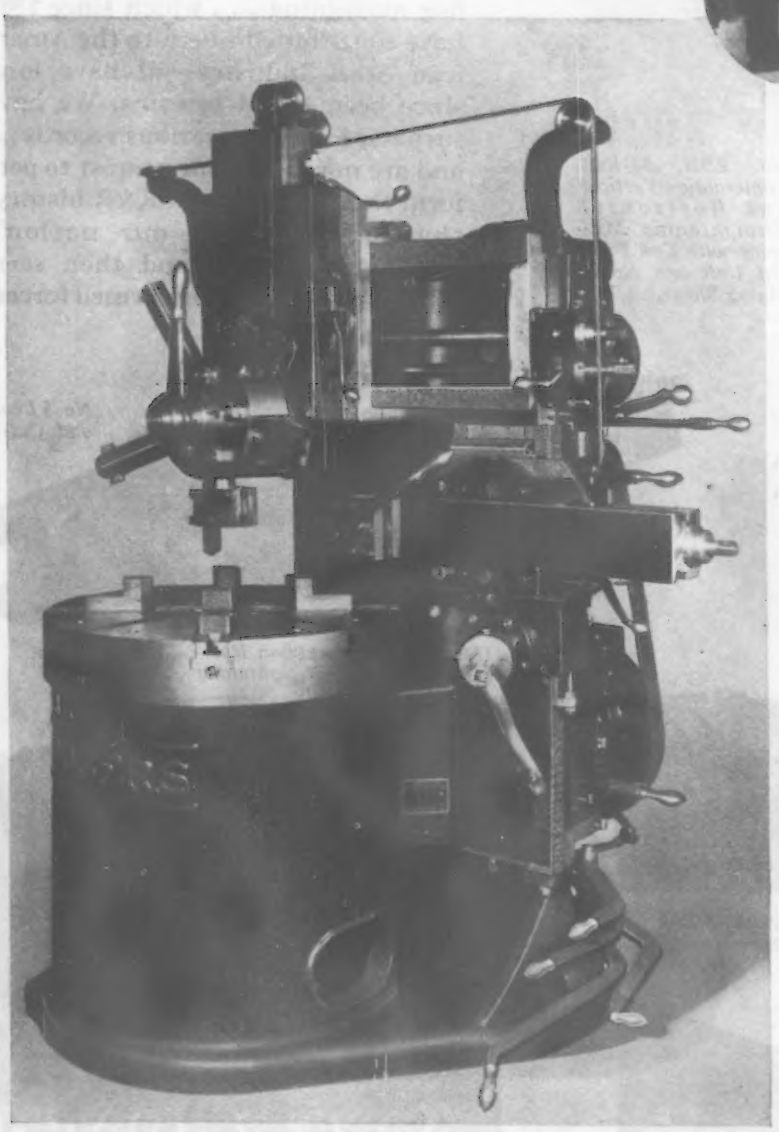


No. 5250B, 5-Roll Rotary Straightening Machine.

No. 6 Standard 8-Roll Straightener.

KANE & ROACH
INCORPORATED
SYRACUSE, N. Y., U. S. A.
Established 1887

HAND SCRAPING BEARING SURFACES IS *Not* A LOST ART AT ROGERS



Only by hand scraping flat bearing surfaces are small "pockets" provided to retain a film of oil on these surfaces. This increases the precision life of Rogers "Perfect 36" Vertical Turret Mills by reducing normal wear.

Also with hand scraping, the facing bearing surfaces are accurately matched to precision tolerances without changing the molecular structure of the metal. This is just another example of the inherent quality of Rogers Mills, — one more reason why you should investigate Rogers Mills *before you buy any equipment to bore, drill, turn or thread ferrous and non-ferrous forgings and castings.*

Check these advantages, too.

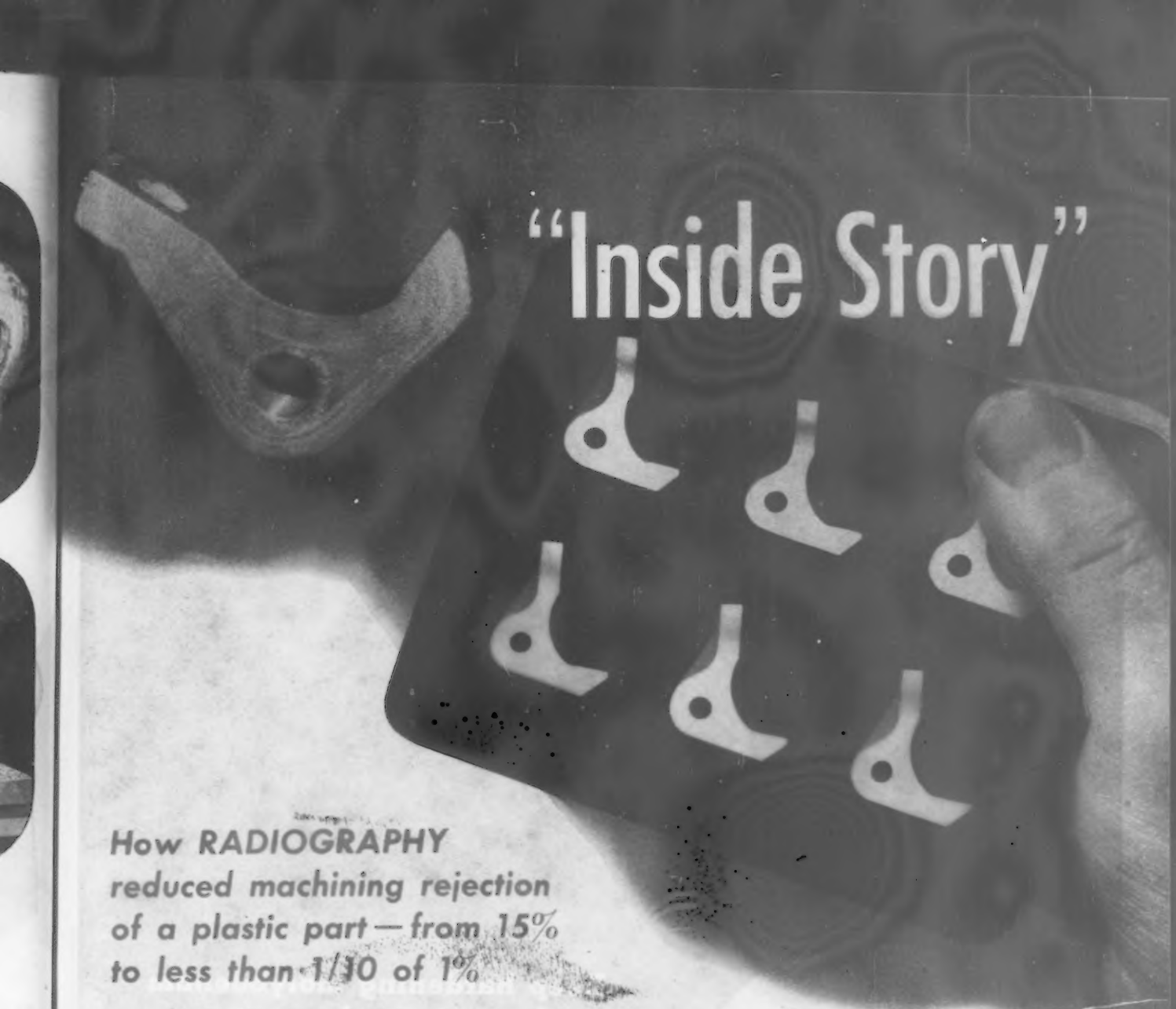
LOW INITIAL COSTS LOW OPERATING COSTS
LOW PRODUCTION COSTS

Write for fully-illustrated catalog today.

ROGERS
MACHINE WORKS, INC.

Sales Offices: 1815 ELMWOOD AVENUE
BUFFALO 7, N. Y.
Factory: ALFRED, N. Y.

Knowing how since 1885



"Inside Story"

How RADIOGRAPHY reduced machining rejection of a plastic part—from 15% to less than 1/10 of 1%

ON the scrap heap every week went 750 completely machined plastic lever assemblies—15% of a week's production—turned down "cold" on final inspection. What to do about it? Radiography found an answer . . .

Through 100% radiographic inspection, the manufacturer traced failures to a drill hole lined with a metal insert . . . around which excessive stress concentrations originated . . .

So far, so good. With the source of trouble uncovered, the manufacturer had something to go on . . . had a point of departure for his engineers—and, as it turned out, for his supplier of raw materials.

New machining technics were tried . . . each step was x-rayed . . . results were analyzed.

This continued study brought the manufacturer—and the co-operative maker of plastic stock—to a point where they could definitely say, "Here's what's wrong." The plastic bars from which the failing part was being cut, while of excellent quality, were not of exactly the right type for the manufacture of this specific part . . .

A change was made, machine technics were improved, the problem was whipped. Rejections tumbled from 15% to less than 1/10 of 1% . . . costs dropped proportionately . . . production was stepped up.

Literally an "inside story"—based on internal study of a failing part. Here again we see radiography as a helper, investigator, business builder. In plants from coast to coast, x-ray helps industry meet rigid inspection standards. Its record of accomplishment in increasing quality, lowering costs, and speeding up production is an indication of radiography's importance tomorrow. Now is the time to consider what it can do for you. See your local x-ray equipment dealer.

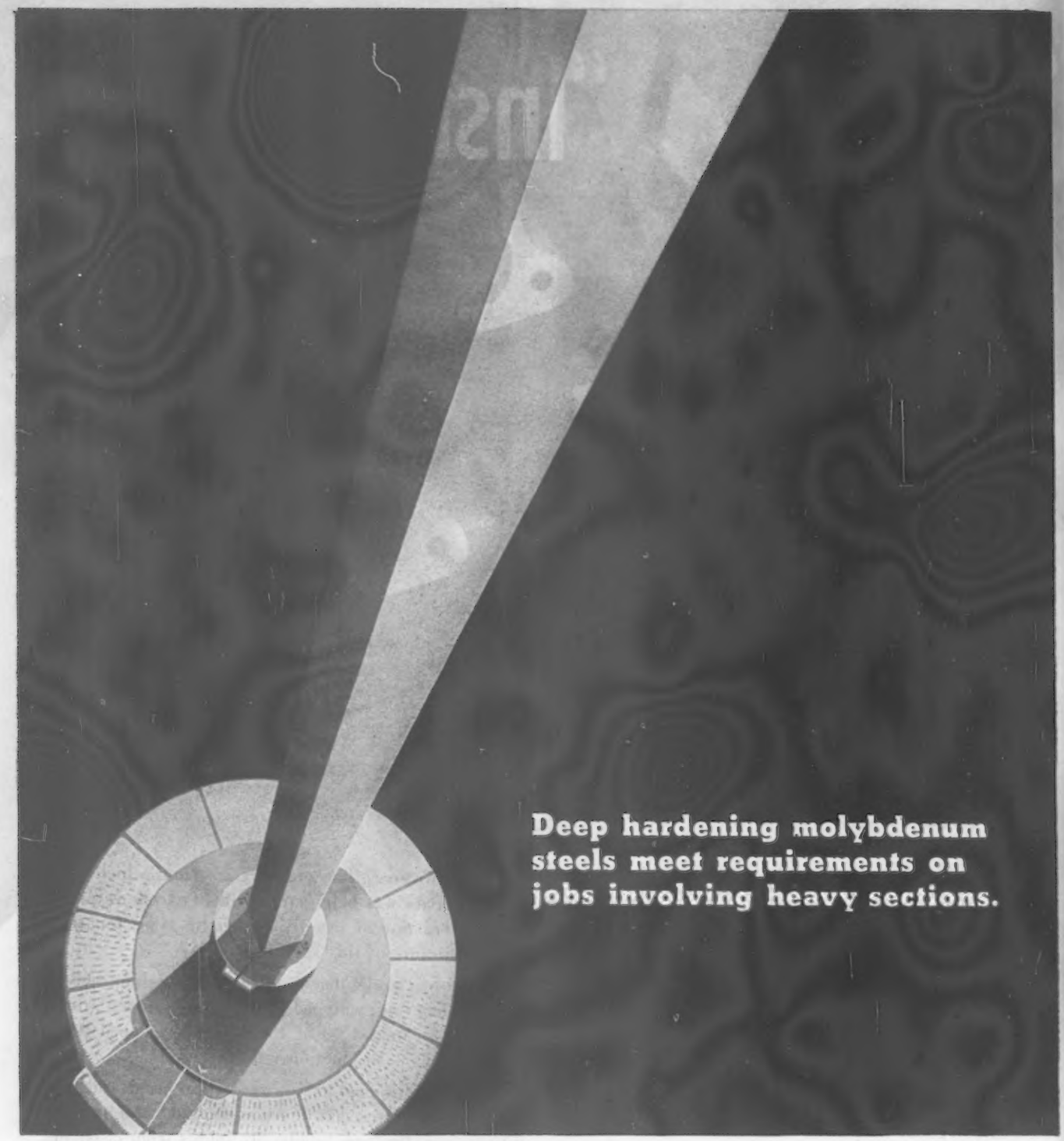
EASTMAN KODAK COMPANY

X-ray Division Rochester 4, N. Y.

Radiography

analyzes . . . instructs . . . corrects . . . improves

Kodak



CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

ARMY E NAVY

MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

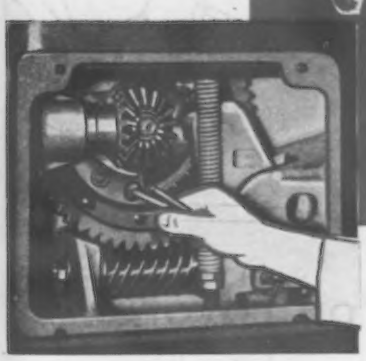
Climax Molybdenum Company

500 Fifth Avenue · New York City

MOLY

ON THE GREENLEE "6" AUTOMATIC SCREW MACHINE

YOU CAN RESET THE STROKE OF THE MAIN TOOL SLIDE IN 5 MINUTES OR LESS



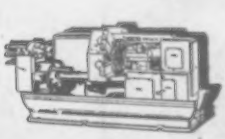
Here is a close-up showing how the main tool slide stroke is set by an adjustable dog on the worm wheel.

EASY TO GET AT. Loosen four clamp screws and remove the cover indicated in the picture above. This exposes the worm wheel of the main tool slide drive mechanism. On this worm wheel there are two dogs, one of which controls the terminal point of rapid approach and the other engages rapid return at the end of the feed stroke. The latter is set at the factory and requires no adjustment.

NO CAMS. On the GREENLEE "6" the main tool slide is operated by a rack and gear mechanism. The purpose of this design is to permit greater flexibility in setting the tool-slide feed stroke and to provide a quick and easy means of adjustment.

SIMPLE ADJUSTMENT. To set the feed stroke of the main tool slide, you simply loosen the feed dog and adjust it to the desired length of stroke. This can be done in five minutes or less. The worm wheel carries a graduated scale for making the setting. Thus, when the feed dog is set at the 1" mark, the tool-slide feed stroke will be 1".

MANY OTHER FEATURES. This description of the main tool slide adjustment shows how simply and rapidly this important set-up adjustment can be made on the GREENLEE "6". In addition, there are many other practical features of set-up and operation which have caused this machine to be often called "the Operator's Favorite."

WRITE TODAY  FOR MORE FACTS

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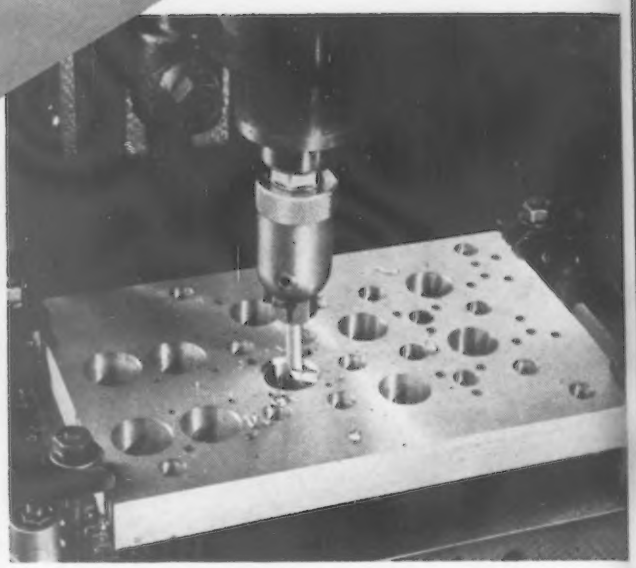
1806 MASON AVE., ROCKFORD, ILLINOIS

GREENLEE

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

HOW TO OBTAIN *increased speed* AND *closer tolerances* IN JIG BORING



NO S-T-O-P and S-T-A-R-T TO CHANGE TOOLS AT EACH HOLE

In the Moore Jig Borer you can *consecutively* spot, drill, bore and ream *all* holes in the work-piece with minimum tool changes. In other words, you don't have to change tools at individual holes for each operation, because there are no size blocks or end measures to labor over.

Accurate lead screws *built into* the Moore Jig Borer enable you to make table settings faster than you can change tools. A glance at your blueprint—a few turns of the micrometer dials and the work is set to precise location. Moore lead screws, accurate to .0002″ over 14″ of travel and .00005″ in any given inch see to that. Another advantage—you make each setting three times, enabling you to quickly notice and correct any errors you may have made.

The Moore Jig Borer is ideally suited for jigs, fixtures, dies, special machine parts and jig-less, small-lot production. It is highly sensitive for holes 1/32″ diameter, yet rugged for heavy cuts up to 4½″.

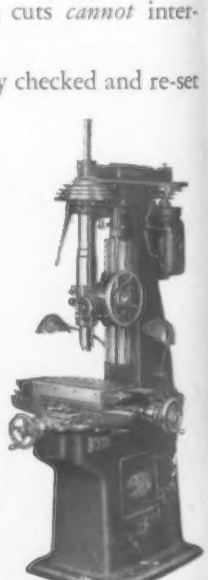
RAPID TABLE SETTINGS PROMOTE GREATER ACCURACY IN FINISH BORING

Rapid table settings on the Moore Jig Borer encourage operators to follow the best toolroom practice—roughing *all* holes before finish-boring *any* of them.

Moore lead screws are so fast to set—faster than tool changes—that it *pays* to pre-rough all holes. Temperature changes or stresses caused by roughing cuts *cannot* interfere with finish-boring.

After roughing, the set-up can be easily checked and re-set before taking any finish cuts.

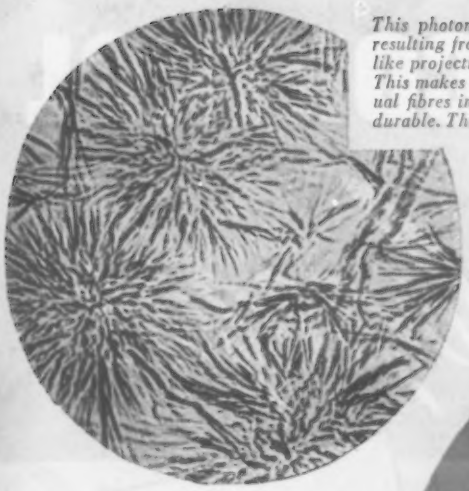
All finish-boring is completed without stressing or heating of the work-piece. These favorable conditions, maintained throughout the entire finish-boring operation, on the Moore Jig Borer, are further assurance of ultimate accuracy in the completed work.



Write today for descriptive literature

MOORE JIG BORER

MOORE SPECIAL TOOL CO., INC., 736 UNION AVE., BRIDGEPORT 7, CONN.



This photomicrograph shows the distinctive lead "soap" formations resulting from Red Lead's reaction with the vehicle. Note how the rod-like projections radiating from central cores spread out and intermesh. This makes a strong, flexible, interwoven structure—just as the individual fibres in a piece of cloth are intertwined to make cloth tough and durable. This type of soap formation is unique with "lead" paint films.

unique LEAD SOAPS...

another important reason why RED LEAD means Extra Rust Protection

Why is Red Lead outstanding as a metal protector?

One of the major reasons is this pigment's remarkable ability to impart to the paint film strong, tough, intertwining lead "soap" formations—as shown in the photomicrograph above.

These unique lead "soaps" improve the paint film in many ways. For one thing, they form a dense, intermeshing matrix which restricts the passage of water through the film. And rusting does not take place without the presence of moisture.

For another, they *mechanically* reinforce the film, giving it extra *strength* and *toughness*.

And again, Red Lead "soaps" contribute all-important *elasticity* — allowing movement along their intermeshing projections. This action helps prevent the ruptures to which a hard, unyielding film is subject. Moreover, when a paint film dries and ages, decomposition of the vehicle sets in. But, because of Red Lead's ability to combine with the decomposition products and form soaps, it increases both the durability of the paint film and its adhesion to the base metal.

Red Lead's extra strength, toughness and elasticity are demonstrated by the tensile strength test below and substantiated by exhaustive research and field service.

Remember, too, that Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including phenolic and alkyd resin types.

Specify RED LEAD for All Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint.

* * *

In this tensile strength tester a typical Red Lead paint film has been stretched 18% without breaking. In withstanding this elongation it has maintained a load of 920 grams. Any film that exhibits these characteristics has unusual strength, toughness and elasticity. As metals expand and contract only a fraction of one percent, this film would adhere under the most extreme conditions.

No matter what price you pay, you'll get a better paint for surface protection of metal, if it contains Red Lead.

Write for New Booklet—"Red Lead in Corrosion Resistant Paints" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas—ranging from Red Lead-Linseed Oil paints to Red Lead-Mixed Pigment-Varnish types. If you haven't received your copy, address nearest branch listed below.

* * *

All types of metal protective paints are constantly being tested at National Lead's many proving grounds. The benefit of our extensive experience with Red Lead paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6, Buffalo 3, Chicago 80, Cincinnati 3, Cleveland 13, St. Louis 1, San Francisco 10, Boston 6 (National-Boston Lead Co.); Pittsburgh 30 (National Lead & Oil Co. of Penna); Philadelphia 7 (John T. Lewis & Bros. Co.); Charleston, W. Va. (Evans Lead Division).

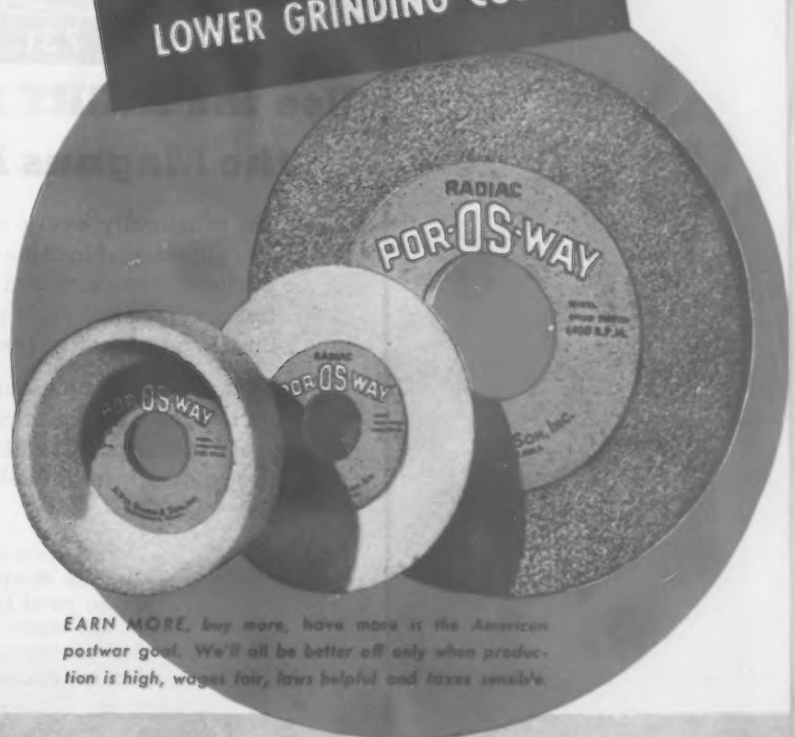
DUTCH BOY RED LEAD

A VALUABLE TIP ON CARBIDE-TIPPED TOOL GRINDING

Want better, faster precision grinding of carbide-tipped tools and dies? Use the Por-os-way wheel with green silicon carbide—the "wonder" grit now back from war. Won't burn or discolor. Gives exceptional performance at *any* speed!

MACHINISTS took to Por-os-way in a big way right from the start. They tried it out, liked it, and used it on all kinds of exacting war jobs. Por-os-way gives astounding results on both rough grinding and precision finishing. Its *open structure* cuts hardest metals at unbelievable speed, much deeper, much cooler, much longer, with fewer rejects. With Por-os-way backing them up, your men will turn out more work, better and cheaper. You'll keep war production rolling, get a head start cutting grinding costs below postwar competition. If it's hard to believe that Por-os-way has seldom been pushed to its limit, just call in a Por-os-way engineer and let him show you how to grind the startling new way, the *profitable* new way . . . the Por-os-way! A. P. de Sanno & Son, Inc. 434 Wheatland Street, Phoenixville, Pa., Since 1893.

2 TO 5 TIMES LOWER GRINDING COSTS



EARN MORE, buy more, have more at the American postwar goal. We'll all be better off only when production is high, wages fair, laws helpful and taxes sensible.

←LOOK AT THE DIFFERENCE!

Your eye tells you at a glance why Por-os-way is *different.* See the *extra porosity* that gives you over 8 distinct operating advantages!

*T. M. Reg. U.S. Pat. Off.

NO MOAN—NO GROAN—NO GRUNT IN SEGMENTAL GRINDING

Por-os-way is the easy way to speed up your surface grinding, decrease grinding noise and wheel dressing. No moan, no groan, no grunt with Por-os-way segments, for their sharp edges cut the metal, don't "scrape" the surface. Por-os-way digs deeper, cuts faster, lasts longer, too. Get it for *results*!

RADIAC*

POR·OS·WAY*

The Precision Grinding Wheel

THE WHEEL THAT COSTS THE MOST AT FIRST...COSTS THE LEAST AT LAST

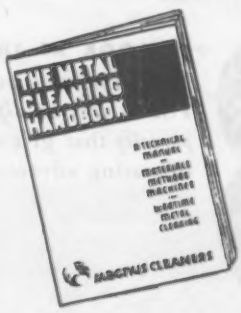
CLEAN METALS Faster Better and at Lower Cost!

Use the RIGHT Magnus Cleaner in the Magnus Aja-Dip Cleaning Machine

On practically every metal cleaning operation, the Magnus Aja-Dip Cleaning Machine and the Magnus Cleaner designed for the particular work, metal and dirt involved, will speed up cleaning by a surprisingly large margin. Moreover, you will get greatly improved cleaning results.

This is due to the vigorous, many times repeated "swishing" contact of the cleaning solution with all surfaces *and recesses* of the work that is provided by the Magnus method of raising and lowering the work *in* the solution.

Write for your copy of the Magnus Metal Cleaning Handbook—the complete manual on metal cleaning methods, materials and machines. When you've read it, then ask us to recommend the method and the cleaner best adapted to your work.



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For Your Small Wheel Jobs, Too . . .
Specify "NORTON"
FOR all kinds of internal grinding jobs and other types of small wheel jobs there's a complete line of Norton Grinding Wheels.
They are available in Alundum, 19 Alundum, 38 Alundum, 57 Alundum, and Crystolon abrasives, in vitrified, BE vitrified and resinoid bonds. Especially effective on some internal grinding jobs are Norton OPEN STRUCTURE Wheels.
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And, of course, there's a complete line of Norton Mounted Wheels.
Your Norton abrasive engineer will be glad to study your small wheel jobs and make specific recommendations. The Norton booklet "The ABC of Internal Grinding" is full of practical information. Write for Form 4361A.
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NORTON ABRASIVES

W-1014

Presteel Solves a Problem for Typewriter Manufacturer

This manufacturer had always made its own stampings, and had tooled up to produce the steel ribbon cover shown above. Difficulty was experienced in providing enough metal for the rear overhang without wrinkling the top surface. So Presteel was called into the picture, and—as usual—solved the problem.

This manufacturer, incidentally, uses Presteel Cold Rolled Strip Steel for much of its own stamping production.

Few industries have not availed themselves of the services of the Worcester Pressed Steel Company. In all likelihood Presteel has contributed to the development of interchangeable parts for many of the machines in your own offices and shops. Why not investigate the possibilities for lowering costs and improving the quality of your own products by the use of Presteel metal stampings. Mail samples or prints to:

WORCESTER PRESSED STEEL CO.

406 BARBER AVENUE, WORCESTER 6, MASS.

ALLOY STEELS AND OTHER METALS COLD FASHIONED SINCE 1883

TYPES OF SUPERIOR TUBING IN MANY METALS—MAX. OD—5/8"

MECHANICAL—Analyses generally handled are SAE 1010, 1015, 1020, 1025, and 1035. They are used wherever tubes are machined, formed, bent, etc.

AIRCRAFT—Requirements of this industry cover every analysis. Major production is in SAE 4130X, SAE 1025, SAE 1010, Stainless Types 304, 321, and 347, Inconel and Aluminum. Government specifications in constant use are AN-WW-T-846, AN-WW-T-850A, AN-WW-T-855, AN-WW-T-858, AN-WW-T-861, and AN-T-43. Also certain AMS specifications, with reservations because of size range or availability of redraw stock. As substitutes become available, Superior will advise customers as far in advance as possible. Practically all of these changes will be forced by war conditions, but we are confident that the substitutes will be every bit as effective for the application as the material being supplanted.

INSTRUMENT TUBING—In this field, Superior furnishes hypodermic needle tubing, metal tubing for surgical instruments and parts, pointer tubing for electrical instruments, flattened tubing for Bourdon Springs. The hypodermic needle tubing is available in all standard sizes in the temper developed over a period of years, as most suitable for the application. The pointer tubing is generally aluminum where you get the combination of extreme lightness and maximum strength. For Bourdon Springs, Superior uses SAE 4130 X and Beryllium Copper.

CORROSION RESISTANT TUBING—In this category, Superior places the Stainless Steels, Nickel, Monel, Inconel, Copper and Aluminum. All of these are handled more or less regularly. The use of these alloys is indicated wherever you would find the problem of corrosion, whether because of acids, atmosphere, etc.

TUBING FOR ELECTRONIC APPLICATIONS—At the present time, Superior is furnishing Seamless Nickel, Monel, Inconel and Stainless. The tubes are used as anodes and cathodes in practically all types of Electronic tubes. In addition, we produce Lockseam Sleeves** made from Nickel strip and also some Lapsleeves made in somewhat the same way. Also tubing with special magnetic and glass sealing properties can be obtained. We urge you to get in touch with us when you are developing a design.

** U. S. Patented

SUPERIOR

THE BIG NAME IN SMALL TUBING

SUPERIOR TUBE COMPANY, NORRISTOWN, PENNSYLVANIA

ARMY NAVY

FOR EVERY SMALL TUBING APPLICATION FROM 5/8" OD DOWN

SUPERIOR Seamless in various analyses. WELDRAWN Welded and drawn Stainless, "Monel" and "Inconel"

SEAMLESS and Patented LOCKSEAM Cathode Sleeves

1600 lbs PRESSURE

PER SQUARE INCH

DID NOT BREAK

Salkover

COPPER BRAZED JOINTS

• To determine the strength of Salkover copper brazed joints in U. S. Army Insecticide Bombs a destructive pressure of 1600 lbs. per square inch was applied—8 times the normal pressure test of 200 lbs.

Despite grotesque distortion of the thin sheet steel shells, not one of the five Salkover brazed joints failed! The brazed middle seam expanded 15%, yet it remained entirely intact.

Electric furnace copper brazing (also known as Hydrogen Brazing) has been proved the only completely successful method to fabricate these little sheet steel pressure vessels . . . dispensers of miraculous Army insecticides. Salkover plants have copper brazed millions of these dispensers.

Find out what copper brazing can do for you. Call on Salkover Engineers to develop now *your* war and postwar copper brazing applications of any type. Our two plants are fully equipped to handle all your brazing work.

SEND US YOUR BLUEPRINTS OR SAMPLES FOR ANALYSIS AND QUOTATION

No Obligation

Photo at right shows normal exterior view of this 6 inch dispenser, consisting of a simple assembly of stampings and screw machine parts. The five copper brazed joints are completed in one pass through the brazing furnace. Cost is remarkably low.

PLANTS: 4211 W. Lake St., Chicago 24, Ill.; 34-18 Borden Ave., Long Island City 1, N.Y.

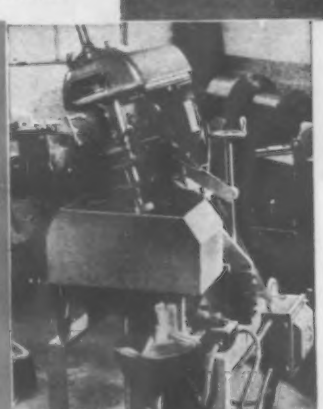
COMMERCIAL ELECTRIC FURNACE COPPER BRAZING
BRIGHT ANNEALING · SILVER SOLDERING

Salkover METAL PROCESSING

FROM EVERY ANGLE...

WALKER-TURNER DRILL HEADS SIMPLIFY RETOOLING PROBLEMS

Four Radial Drill Heads mounted horizontally are used by S.K.F. Industries to drill two opposed holes in bearing races. The drill spindles are interconnected and operated simultaneously, completing two bushings in one operation.



Two Radial Drill Heads working in conjunction to rough grind lens blanks to specified curvature.

20" Drill Head converted to a highly efficient Jib Drill does the work of a 12 foot Radial.

Check These High Spots:

- Operate vertically, horizontally, at any angle — even upside down.
- Careful selection of materials, superior design, rugged construction, assure long service at high level of precision.
- Speed ranges from 85 to 8300 R.P.M.
- Safe, simplified operation.
- Low initial cost—low power consumption—low maintenance.
- Handle Metals, Plastics, Wood, Ceramics, Glass.

For a faster reconversion when the time arrives, it will pay you to look into the tooling possibilities of Walker-Turner Drill Heads, *now!*

Compact, flexible Walker-Turner Drill Heads are available in 20" models (hand or power feed) and 15" models (hand feed or radial). Four ball bearings on splined spindles—full floating spindle pulley — one-piece head casting—many other features—maintain high production and precision, while slashing costs!

WRITE TODAY FOR FREE, FACTUAL DRILL HEAD FOLDER — shows typical special tooling set-ups — construction details — cutaway drawings — prices.

WALKER-TURNER CO., INC., PLAINFIELD, N. J.

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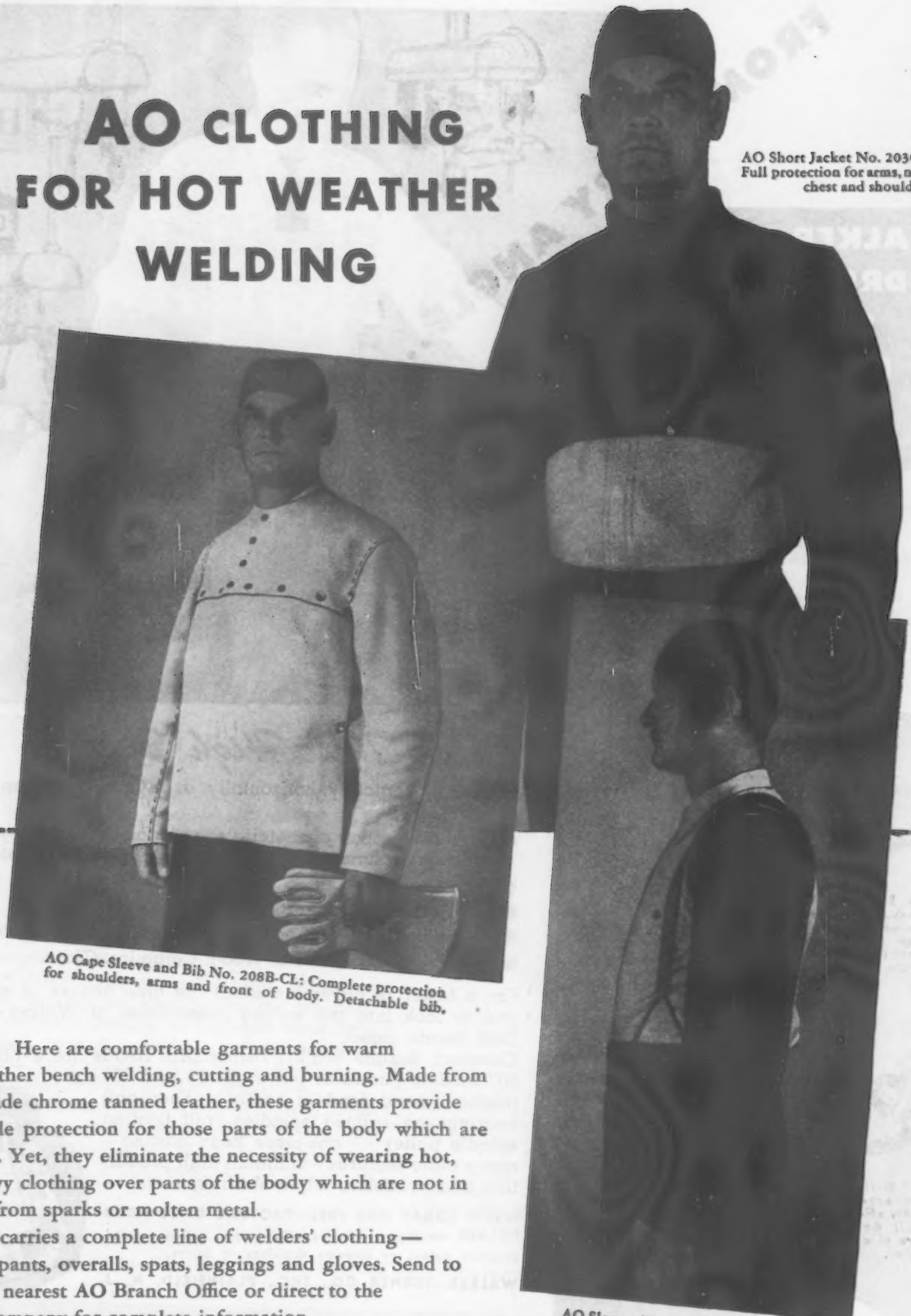
MACHINE TOOLS

DRILL PRESSES — HAND AND POWER FEED • RADIAL DRILLS
METAL-CUTTING BAND SAWS • POLISHING LATHES • FLEXIBLE SHAFT MACHINES
RADIAL CUT-OFF MACHINES FOR METAL • MOTORS • BELT & DISC SURFACERS

AO CLOTHING FOR HOT WEATHER WELDING



AO Short Jacket No. 203CL: Full protection for arms, neck, chest and shoulders.

AO Cape Sleeve and Bib No. 208B-CL: Complete protection for shoulders, arms and front of body. Detachable bib.

Here are comfortable garments for warm weather bench welding, cutting and burning. Made from high grade chrome tanned leather, these garments provide ample protection for those parts of the body which are exposed. Yet, they eliminate the necessity of wearing hot, heavy clothing over parts of the body which are not in danger from sparks or molten metal.

AO carries a complete line of welders' clothing — jackets, pants, overalls, spats, leggings and gloves. Send to your nearest AO Branch Office or direct to the company for complete information.

AO Sleeves No. 209CL: Excellent protection for arms only.

ARMY (E) NAVY

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COMPANY

SOUTHBRIDGE, MASSACHUSETTS

Use the ROTOMILL
...INSTEAD OF THE LATHE

It's FASTER and MORE ECONOMICAL

Machining cylindrical, conical or flanged work such as gear blanks, shafts, steering knuckles, etc. can be done more effectively on the RotoMill than it can on the lathe. A tolerance of .004" in diameter is normally maintained thus eliminating in many cases a final finishing cut.

Metallurgical changes in the surface metal of the work part due to cold working do not occur because there is very little rise in temperature during the cutting operation. For the same reason cutter life is surprisingly long.

A cutter change, when cutters are kept in sets mounted on solid arbors, can be made in about fifteen minutes. Thus the RotoMill is just as effective on short runs as it is on long production jobs.

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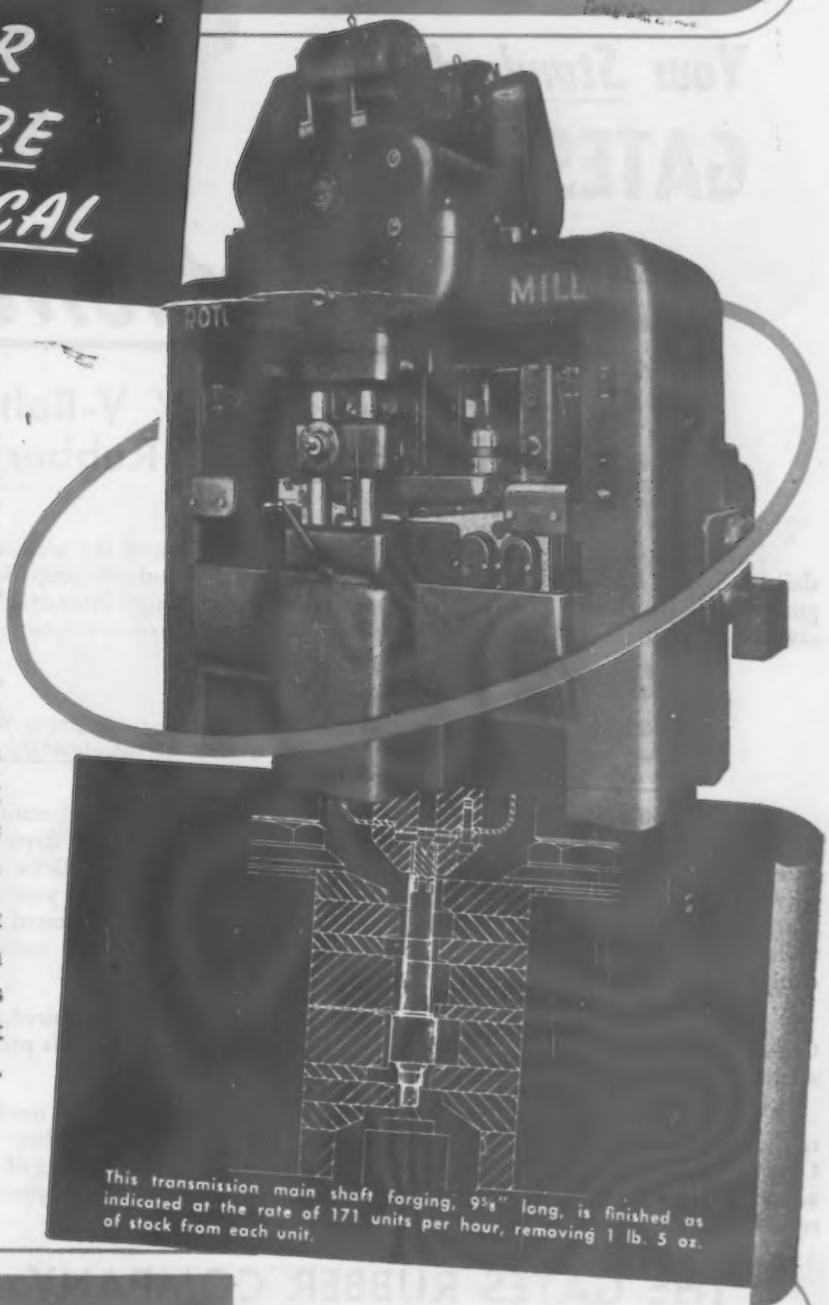
FOR DESCRIPTIVE BULLETIN



This transmission main shaft forging, 9⅝" long, is finished as indicated at the rate of 171 units per hour, removing 1 lb. 5 oz. of stock from each unit.

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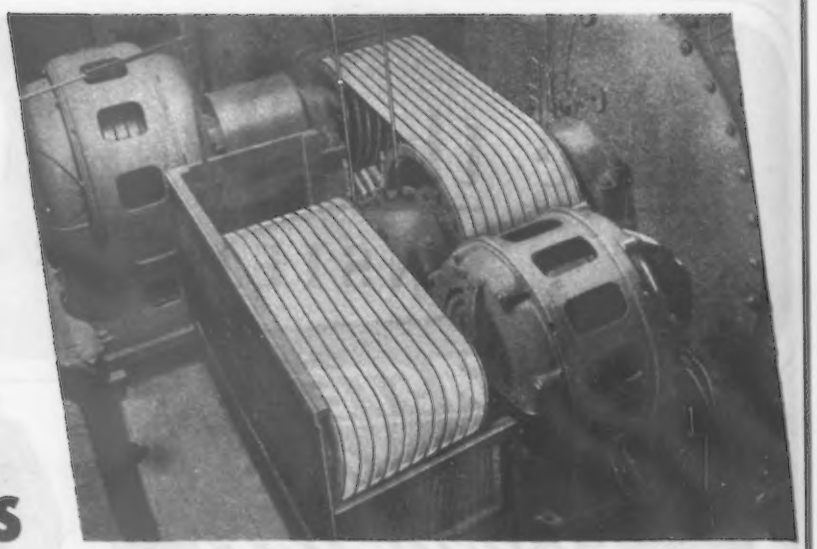
Specialists on SPUR AND HELICAL INVOLUTE GEAR PRACTICE

Originators of ROTARY SHAVING AND ELLIPTOID TOOTH FORMS



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Your *Standard* GATES V-Belts

—Made of *Synthetic* Rubber—

are out-performing *ANY* V-Belts ever made of *NATURAL* Rubber!

No V-Belts built by *anyone* before the war could stand the service now daily delivered by Gates V-Belts on army tanks, tractors and self-propelled big guns. Gates developed these greatly superior V-Belts through intensified, specialized research—and Gates is building these belts entirely of *synthetic rubber.*

This fact is now important to YOU —— and here is the reason:

● **Every improvement developed by Gates for these Army V-Belts has been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.**

In the case of many *other* products, as you know, you must wait until after the war to get the benefits of war-time improvements. But victory depends so directly upon production and production so directly upon V-Belts which drive the producing machines, that Gates has been able to give you *immediately,* in your Standard Gates Vulco Ropes, every V-Belt improvement which Gates specialized research has developed for use in the Army's motorized equipment.

In addition, where V-Belts of special construction are required, your Gates Rubber Engineer is in position to supply a Gates V-Belt that is precisely engineered to meet your special needs.

Whatever drive problem or V-Belt problem you may have, you need only to pick up your phone book and look under the heading "Gates Rubber." The Gate Rubber Engineer will bring right into your plant the full benefits of every advance in V-Belt construction and in drive operation that Gates specialized research has developed.

NOTE: GATES ALSO MAKES THESE SPECIAL BELTS TO MEET EXCEPTIONAL SERVICE NEEDS-

- Rayon Cord V-Belts
- Static-Safety V-Belts
- *Special* Synthetic V-Belts
- Cotton Cord V-Belts
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Engineering Offices and Jobber Stocks in All Large Industrial Centers

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Our metallurgical research laboratory and experimental foundry concentrate all their efforts toward the one goal: to make better Bronze Parts for you:

- Closer-grained alloys.
- Precision molds of special sands.
- Automatic pyrometer control of melting and pouring temperatures for greater uniformity.
- Rigid X-Ray control.
- Strength surpassing all previous standards.

Have your designers or engineers consult with us. We have the experience and facilities to meet their most exacting demands.

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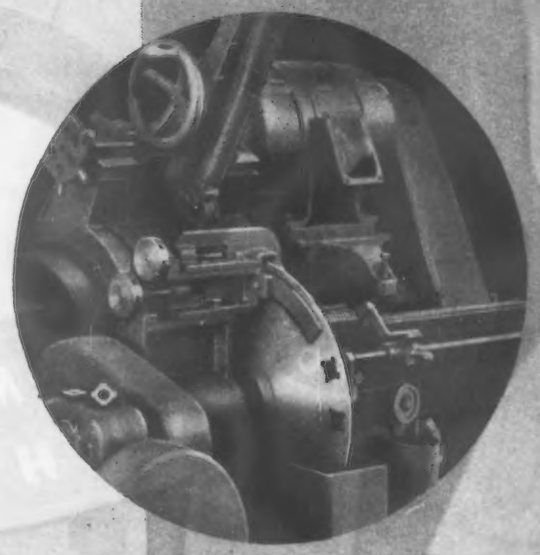
GROUND *in 2 seconds* — and that's only ONE of *dozens* of PARALLEL-SURFACE jobs *adapted to* GARDNER *Double* GRINDING

HERE'S another example of high-production and close accuracies obtained through GARDNER DOUBLE-GRINDING.

The moulded graphite washers shown here, are ground semi-automatically on a Gardner No. 114-20" machine, using a rotary-type work carrier loaded by hand, and automatically unloaded. Machines of this type, in all branches of industry, are turning in production records like the one printed below — it's becoming a common, everyday occurrence.

Did we say-"GROUND IN 2 SECONDS"? It's even BETTER than that—it's 30 TO 40 PIECES PER MINUTE!

Let's look at the record—



THE FULL PRODUCTION STORY:

PART: Moulded graphite washer, 1⅝" dia. x 11/16" hole x ⅛" thick.

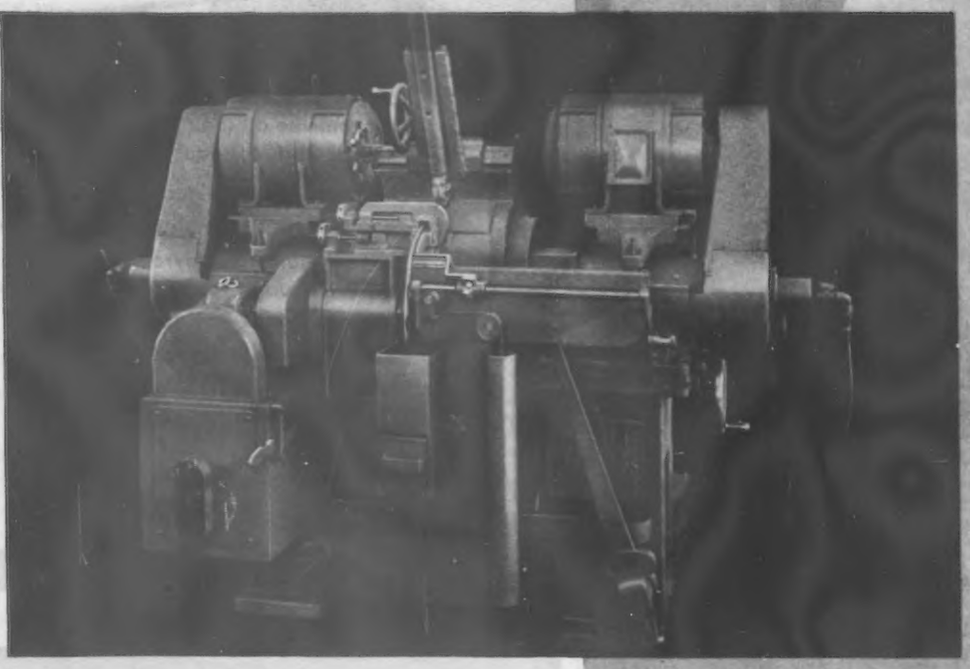
REQUIREMENTS: Grind 2 parallel sides.

STOCK REMOVAL: .030" maximum, overall.

TOLERANCES: Within .0005" for parallelism, and .002" to .003" for size, or uniformity.

PRODUCTION: 30 to 40 pieces PER MINUTE!

Write for our DOUBLE-GRINDING BULLETINS!



ARMY E NAVY

GARDNER MACHINE COMPANY

412 East Gardner Street , , , , Beloit, Wisconsin, U.S.A.

FAST, EFFECTIVE RUST REMOVAL BY *Surface Chemistry**

Above: CLUTCH PLATE

★ TURCO W. O. #1, through Surface Chemistry,* minimizes pre-cleaning and makes neutralizing treatment unnecessary. One continuous operation reconditions metals, passivates surface, prepares it for durable rust-proofing or painting.

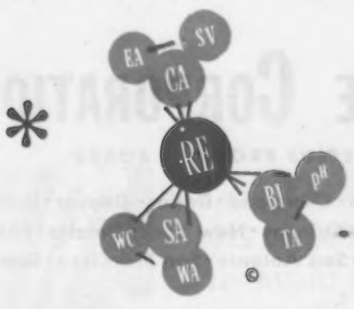
Contains no abrasives, requires neither scouring nor sanding. A short dip in Turco W. O. #1, or a brief wiping makes rust disappear. The wetting properties of Turco W. O. #1 enable it to penetrate screw threads, grooves and crevices which could not be reached any other way.

W.O. #1 wets out and removes minor soil deposits. It it not hindered by presence of light oil film. Unless work is heavily soiled, pre-cleaning is unnecessary.

W. O. #1 deposits an absorbent phosphate film on the surface of the work which bonds tenaciously with primer, paint and rust-proofing compounds.

A W. O. #1 treated surface is therefore not only clean and free of rust, but ready immediately for final processing. One trial will prove it.

Write for full particulars about Turco W. O. #1, another Turco development in *Surface Chemistry.**



*What SURFACE CHEMISTRY is:
WA—Wetting Action
EA—Emulsifying Action
SV—Saponifying Value
SA—Solvent Action
CA—Colloidal Activity
WC—Water Conditioning
BI—Buffer Index
pH—Energy of Alkalinity
TA—Total Alkalinity
RE—Research and Experience

TURCO

INDUSTRIAL CLEANING COMPOUNDS

TURCO PRODUCTS, INC. • Main Office and Factory: 6135 S. Central Ave., Los Angeles 1 • Offices and Factories: 1606 Henderson St., Houston 10, Tex 125 W. 46th St., Chicago 9 • Offices and Warehouses: All Principal Cities

MUSIC WIRE and HIGH CARBON STRIP STEEL

can be substituted for your shortage items!

(Government Surplus Property)

IMMEDIATE DELIVERY THROUGH
RECONSTRUCTION FINANCE CORPORATION

PRICED FOR USE AS SUBSTITUTES

Begin negotiations for your share in large available tonnage of music wire and strip steel.

Shortages of wire and strip steel have put mill deliveries well into the future. Both these items are now on sale at prices to permit substitution for many other grades of wire and strip.

A CONTINUING SALE

This continuing sale by Reconstruction Finance Corporation places at your disposal *new* music steel spring wire in excellent condition, and new high carbon, cold-rolled strip steel, in fair to good condition. The strip steel is in many gauges and widths, mostly in coils. The music wire is well-protected, and is available in various gauges, catchweight coils. Both classifications are priced for use as substitutes for many other grades of wire or strip. The music wire is located in Boston, New York, Philadelphia, Cleveland, Chicago, and Pacific Coast regions; the strip steel in the East and Middle West.

IT'S EASY TO BUY FROM RFC

Sales will be made direct to purchaser. Contact your nearest RFC Disposing Agency for complete information.

ASK YOUR NEAREST RFC DISPOSING AGENCY FOR INFORMATION ON AVAILABILITY OF CARBON BARS, ALLOY BARS AND TOOL STEEL

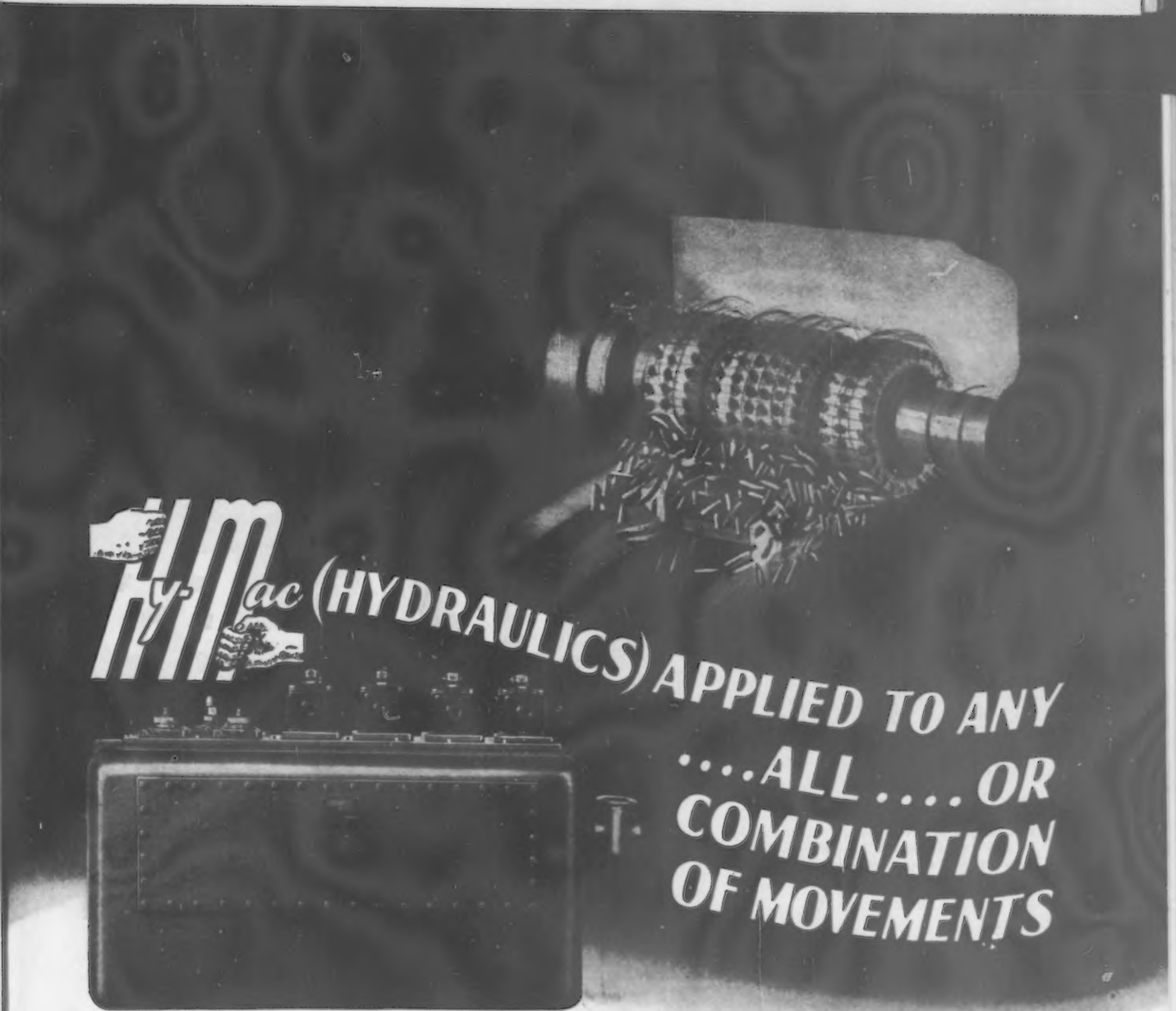
RECONSTRUCTION FINANCE CORPORATION

A DISPOSAL AGENCY DESIGNATED BY THE SURPLUS PROPERTY BOARD

Disposing Agencies at: Atlanta • Boston • Charlotte • Chicago • Cleveland • Dallas • Denver • Detroit Houston • Kansas City, Mo. • Los Angeles • Minneapolis • New Orleans • New York • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle

BUY WAR BONDS

26



12777—Special power unit for controlling and actuating a special contour type milling machine with multiple slides. This design permits the assembly of the completed unit on the base of the machine and provides easy accessibility for adjustment and maintenance. The control is electric through push-button and limit switches, reducing the piping to a minimum, the only pipes being used, other than those incorporated in the unit itself, are those connecting the unit to the actuating cylinders.

"Hy-Mac" Hydraulic Power Units can be applied to milling, drilling, grinding, boring, piercing, riveting, broaching, pressing . . . just determine the functions of the machines that are to be hydraulically operated—and our engineers will recommend a Power Unit and a layout of circuits to best do the job . . . For feed and traverse of multiple or single tools . . . for indexing and locating . . . for clamping, etc. . . . any . . . all . . . or combination of movements can be adapted to "Hy-Mac" HYDRAULICS . . . Designers or builders of machines can accommodate their specific design, either partially or completely to "HY-MAC" HYDRAULICS . . . and our modern plant, together with a comprehensive engineering department is completely competent to handle all of the technical planning, designing, and detailing in connection with building of hydraulic and specific-purpose machinery . . . Our engineers will make recommendation and preliminary proposal without obligation.

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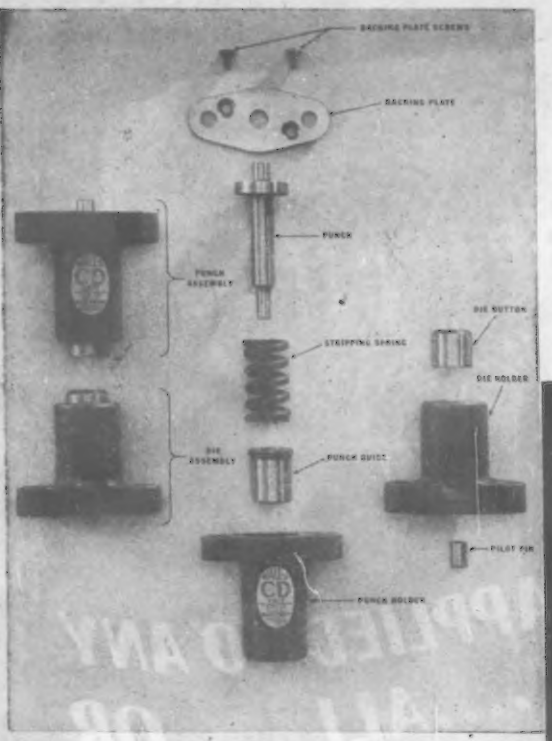
12825 FORD ROAD **DEARBORN, MICHIGAN**
HYDRAULIC MACHINERY—WESTERN DIVISION • 1105 N. Pacific Ave., Glendale 2, Calif.

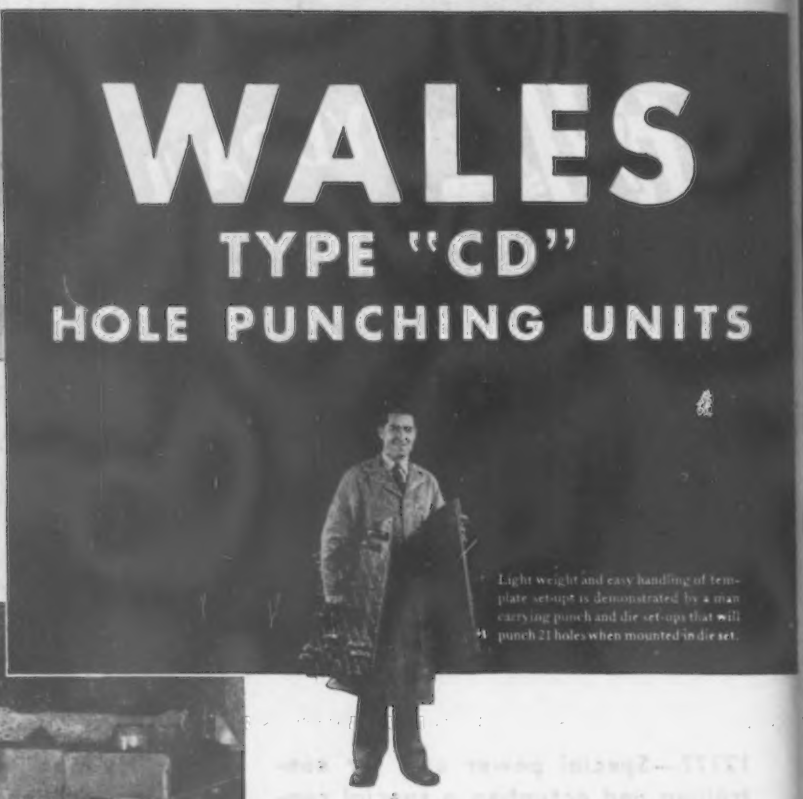
HYDRAULIC MACHINERY

SIMPLIFY... STANDARDIZE... SAVE WITH...

WALES
TYPE "CD"
HOLE PUNCHING UNITS

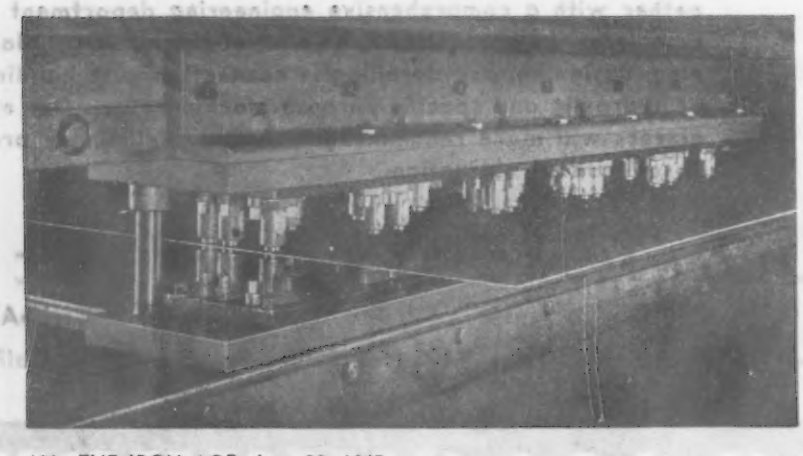


Showing all parts of Wales Type "CD" Units assembled and disassembled. These parts are easily assembled and disassembled for quick changes.



Light weight and easy handling of template set-upt is demonstrated by a man carrying punch and die set-ups that will punch 21 holes when mounted in die set.

Illustrating the work being punched with stamping press ram in down position.



Showing the work in a press brake set-up. Note unobstructed feeding of the work.

● The customary expensive and time-consuming methods usually associated with building a single purpose die to punch a multiplicity of holes is *eliminated* with Wales Type "CD" Hole Punching Units.

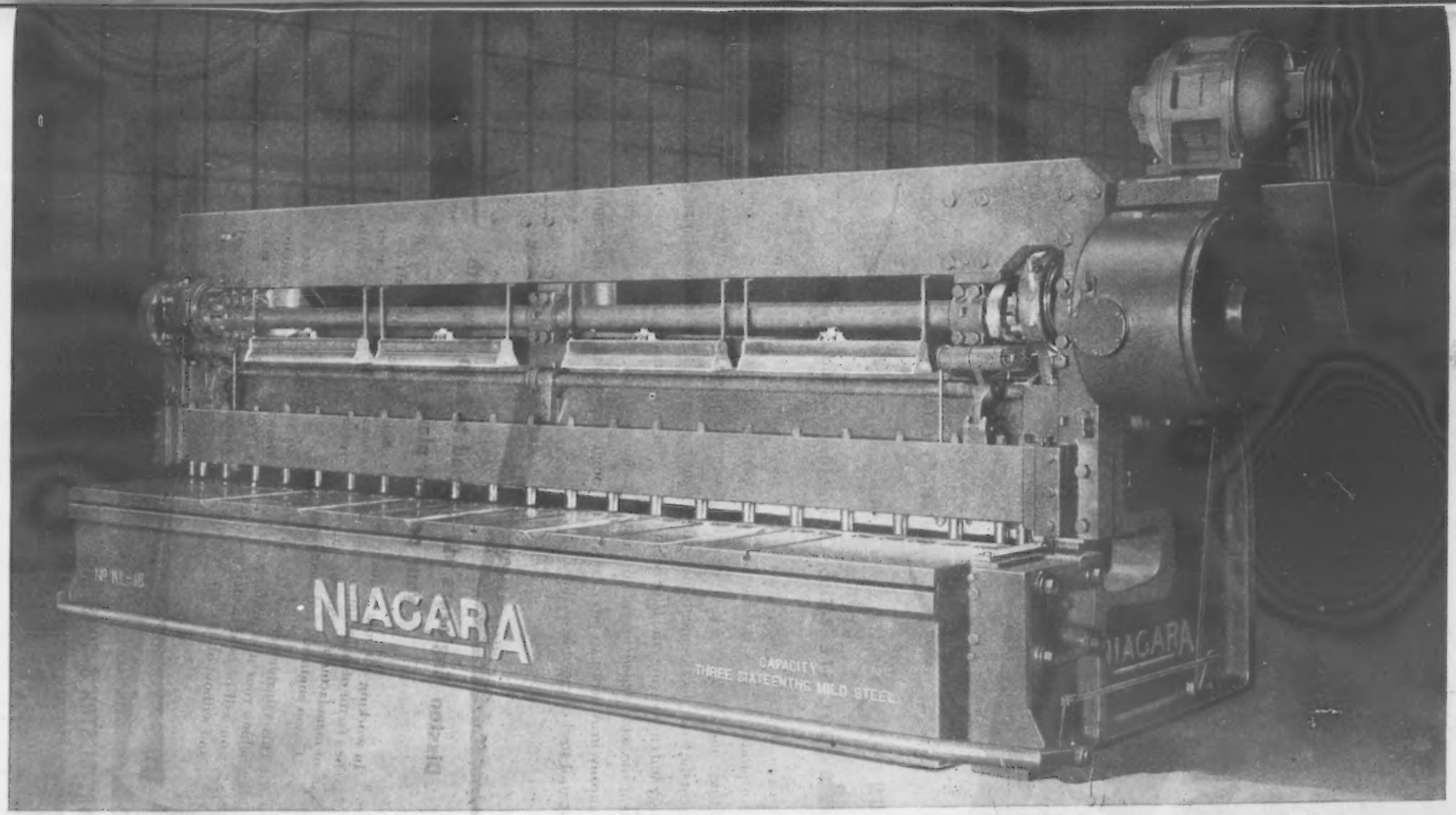
SAVE making special punches and punch plates, special stripper plates and special die buttons and die plates.

SIMPLIFY die design and die making. STANDARDIZED Wales punches, dies, and stripping mechanisms permit units and parts to be carried in stock for setting up and servicing.

Write TODAY for functionally colored, 32-page catalog with 48 illustrations showing these Units being set up and operating in stamping presses and press brakes.

WALES-STRIPPIT CORPORATION
351 PAYNE AVENUE,
NORTH TONAWANDA, NEW YORK
(Between Buffalo and Niagara Falls)
GEORGE P. WALES, President

Specialists in Punching and Notching Equipment



More production per hour on shearing long sheets is made possible by the advanced design of 16, 18 and 20 foot Niagara Power Squaring Shears. Features include accurate, flat cutting; convenient handling of stock and offcut; more working strokes per hour; instant acting 14-point engagement sleeve clutch; gears mounted between anti-friction bearings; clutch and gears operate in oil-tight case; self measuring, ball bearing, parallel back gage. Write for Bulletin 72. Niagara Machine & Tool Works, 637-97 Northland Avenue, Buffalo 11, N. Y. District Offices: Cleveland, Detroit, New York.

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TOOL STEELS for Cutting, Blanking and Forming

You can always be sure of a sound, clean product when it is made of any of these fine Disston Steels. They represent the latest developments in metallurgy and engineering, and have behind them the wide experience of the first company in America to produce electric tool steel of crucible quality.

Each of these highly specialized Disston Steels is made of carefully selected ingredients . . . by modern steel practice . . . in electric furnaces . . . under automatic control. You can count on them, at all times, for thorough dependability and uniformity.

ESTABLISHED 1840

REG. U.S. PAT. OFF.

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In working out your postwar plans, the choice of the right steels may be a factor of major importance. This has been true with a large number of manufacturers, many of whom have profited from consultation with Disston engineers and metallurgists.

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Versatility---for Every Precision Job

SOUTH BEND ATTACHMENTS BROADEN THE SCOPE OF YOUR LATHE WORK

A complete line of attachments and accessories simplifies tooling South Bend Lathes for many special and unusual kinds of precision work. They save time and effort, often eliminate the delay and expense of special fixtures, and greatly broaden the scope of your lathe work. Write for Catalog 77-R in which all of these attachments are illustrated and described.

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South Bend Lathes have a wide range of spindle speeds and power feeds. Full quick change gear mechanism permits instant selection of any thread cutting feed, power turning feed, or power facing-feed. Convenient, quick acting controls and easy reading graduations contribute to smooth lathe operation and efficiency.

South Bend Engine Lathes and Toolroom Lathes are made in five sizes: 9″, 10″, 13″, 14½″, and 16″ swings. Precision Turret Lathes are available in two sizes: ½″ and 1″ collet capacity. Write for new Catalog 100-D giving full descriptions of all lathes.

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No one at this moment can profess full acquaintance with all the uses of powdered metals. Production is being diversified too rapidly and knowledge of what can be done is being extended too fast, in too many directions, for that. But manufacturers who wish to inform themselves of such developments will find it of interest that the Molybdenum Corporation, being a supplier of high-purity metal powders and alloy powders of exactly specified content, is also a source of advice on many of the new possibilities in this field. Powders of molybdenum, tungsten, and boron, in different particle sizes and different degrees of purity, are made and recommended for different requirements. A descriptive catalog of M.C.A. products is issued and correspondence is invited.

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MOLYBDENUM CORPORATION OF AMERICA
GRANT BUILDING PITTSBURGH, PA.

MCA

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CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLLS
#50 Kane & Roach Pinch Type Angle Bending Roll Motor Driven. Capacity Leg Out 1½"x1½"x3/16" or Leg In 1¼"x1¼"x3/16".
#1 Kane & Roach Angle Bending Roll Motor Driven Capacity Leg Out 2"x2"x½". Leg In 1¼"x1½"x¼".

BENDER & STRAIGHTENER
#1½ Cleveland Bending & Straightening Machine Belted Motor Drive. Capacity 15" I-Beams

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5½" bar Niles-Bement-Pond Horizontal Boring Mill. Motor Driven

BRAKES—PRESS TYPE
10' Ohl Press Brake, Motor Driven. Capacity ⅜" Plate
72" Dreis & Krump #255 Press Brake. Motor Driven. Capacity #16 Gauge

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5 ton Shaw	9'6" Span.	220/3/60 A.C.
3 ton Shepard	35'4" Span.	110 Volt D.C.
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10 ton P & H	57' Span.	220 Volt D.C.
15 ton P & H	60' Span.	230 Volt D.C.
15 ton Whiting	72' Span.	230 Volt D.C.
5 ton Auxiliary Hoist		
20 ton Niles	33' Span.	220 Volt D.C.
20 ton Morgan	60' Span.	220 Volt D.C.
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150 ton Whiting	30" Span.	440/3/60 A.C.
Two 25 ton Auxiliaries		

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5 ton Cleveland 40' Span Bucket Handling Crane. 44' Bridge Extension which raises and lowers. Complete with five 220 V DC Motors

DRAW BENCH
50,000 lb. Columbia Draw Bench, M.D. Will draw bars or tubes up to 42' long

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1200, 1600, 2000# Chambersburg

HAMMERS—STEAM DROP
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800 lb. Chambersburg
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No. 2 Style B NAZEL Hammer, Arr. M.D.
No. 4 Style B NAZEL Hammer, M.D.

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48" McKay Roller Leveller, Arr. M.D. Nine rolls 7⅝" dia. Cap. to handle 42" max. width sheet x ¼" medium carbon steel; Falk Motoreducer. Size 70 D.C. RPM 870 to 29.5

LIFTING MAGNET
20"x35" Cutler Hammer Lifting Magnet 230 volt D.C. with 5 KW Crocker Wheeler Motor Generator Set

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12'x7'x25'6" Niles-Bement-Pond Planer Motor Driven. Two Rail Heads
42"x42"x12' Niles-Bement-Pond Planer. Two Rail Heads. Motor Driven

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Espen Lucas Rotary Planer, Motor Driven. Capacity 14" Columns

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600 ton Watson Stillman Hydraulic Press 21" Stroke, 24"x24" Platen

PRESSES—TOGGLE DRAWING
#162 Toledo, 21" Between Uprights, 5" Stroke of Blankholder, 8¼" Stroke of Plunger
#14 Bliss Single Crank, 52" Between Uprights, 18" Stroke of Blankholder, 26" Stroke of Punch
#410 Bliss Double Geared Dble. Crane, 71⅛" between uprights, 16¼" stroke of blankholder, 23½" stroke of plunger
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#3½ Bliss Overhanging Dble. Crank, 1¾" Stroke, Bed Area 42"x30"

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#73½ Bliss Trimming Press, Flywheel
#57 Toledo Trimming Press, 5" Stroke
#58 Toledo Trimming Press, 5" Stroke
1500 lb. Chambersburg Steam Drop Hammer. No. 12 Erie Trimming Press
For Sale as a Unit

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#20 Pels Type BLUEFG, Motor Driven, Capacity 6"x6" Angles

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8"x8" Standard Single Stand Two High
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72" Plate Straightening Roll, Seven 8" Dia. Rolls Capacity ⅜" Plate

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60" Newton Cutoff Saw, Motor Driven. Capacity 16" Diameter
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No. 6R United Engr. & Fdry. Co. Alligator Shear, B.D. Approx. Capacity 6"

SHEAR—GATE
100"x¾" PELS Gate Shear, M.D.

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#60A Quickwork Rotary Shear. Motor Drive 18" Throat. Capacity Shear 1" Plate

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17' Bertsch #4 Squaring Shear. Capacity 10 gauge

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60" Niles Slotter, Motor Driven incl. 20 H.P. D.C. Motor. Side of Table 54"x54", 5' Longitudinal travel, 5' transverse travel

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No. 2 Treadwell High Speed Straightener, Arr. M.D. Power Driven Rolls. Timken Bearings. Capacity ⅛" to 3½" Tubing, ⅛ to 2½" Bars O.D.
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500 Amp. Lincoln Type SAC Welder, 40 volts NEMA, Motor 220/3/60 RPM

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1⅝"x7" Aldrich Vertical Triplex Pump, Capacity 15 GPM at 6000#

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72"x48"x24" GRAY PLANER, two heads on rail, reversing motor drive—price $4500.00

18" LIBBY TURRET LATHE, 3½" hole, arranged for motor drive

4-spindle HENRY & WRIGHT BALL BEARING DRILL (11)

24"x36"x10' INGERSOLL HORIZONTAL SPINDLE SLAB MILLING MACHINE, arranged for motor drive

26"x25"x12' INGERSOLL ADJUSTABLE RAIL MILLER, arranged for motor drive, one head

1—No. 1—18" CINCINNATI PLAIN AUTOMATIC MILLER, latest model

HILL-CLARKE MACHINERY COMPANY
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Chicago 6, Illinois

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BORING MILL, 24" Bullard, M.D.
BORING MILL, 60" N-B-P, M.D.
BORING MILL, Horiz. Barrett, bar 5"x20' long
BUFFERS, Gardner 4 H.P. 230 Volts D.C.
DRILL, 6 spindle Moline Heavy Hole Hog
DRILL, #13 Natco, 18 spindles, B.D.
DRILL, Radial, 5' Cincinnati-Bickford, M.D.
DRILL, Radial, 6' Cincinnati-Bickford, M.D.
GEAR CUTTER, spur 40" G & E, S.P.D.
GEAR PLANER, bevel 54" Gleason, M.D.
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HAMMERS, steam forging, 1100 lb. N-B-P
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LATHE, 18"x14' Lodge & Shipley, cone drive, L.C.G.
LATHE, 18"x13' Draper, grd. head, M. D.
LATHE, 24"x17' LeBlond, grd. head, M.D.
LATHE, 24"x10' Lodge & Shipley, patented head
MILLER, Cincinnati Auto., table 11"x60", B.D.
MILLER, No. 4B horiz. plain B & S, grd. hd., M.D.
MILLER, No. 4 vert., Cinc., hi-power, grd. hd., M.D.
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TURRET LATHE, 34" Gisholt, "K", H.S. 4¼"
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24" Bullard "New Era," Motor 3/60.
36" Colburn, 1-Turret Hd., MD. (modern).
42" Gisholt, Turret & Swivel Hd., MD.
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72"x36', light pattern, motor drive.
48"x32' Niles-Bement-Pond, QCG., MD.

PLANER (Double Housing)
60"x60"x18' Niles-Bement-Pond "Timesaver," 4-heads, Power Rapid Traverse, with motors 220 volts DC. Also M.G. Set 3/60/220 to 230 volts DC. Near new.

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See our partial list page 243
June 21st Issue

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Automatic Screw Machines
BROWN & SHARPE No. 0, 2 auto. screw machines, M.D.
NEW BRITAIN ⅝", 1", 1⅝", six spindle auto., M.D.
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⅝"-⅞" Cleveland "B"
1" Cleveland Model J double end
1⅜" Gridley "G" 4 spindle
1⅝" New Britain 6 spindle
2" x 18" Cleveland Model B
4½" Gridley "H" 4 spindle chucking
No. 454 New Britain 4 spindle chucking
6" x 6¾" Goss & DeLeeuw chucking
14" x 18" Monarch "Magnamatic"
14" x 19" Fay
15" x 22½" Sundstrand auto. stub
No. 16 Gisholt Simplimatics

BORING MILLS

2½" bar Universal
3¼" bar Blomquist Eck
4½" bar Universal Triway
5" bar Barrett Cylinder

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No. 2 Standard screw press
No. 2S Lapointe hydraulic
No. 3 Lapointe double screw
No. 1 Foote Burt vert. surface, hydraulic
No. V2 American vertical hydraulic
Twin 10 Oilgear hydraulic

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No. 12 Barber Colman
No. 16 HS Gould & Eberhardt
No. 1 Lees Bradner
Nos. 7 & Z1 Fellows
24" x 12" Flather auto. spur
26" x 48" Brown & Sharpe auto. spur
64" x 20" Gould & Eber., auto. spur
Gleason bevel equipment, all types

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10" x 18", 10" x 36", 10" x 50" Norton
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Nos. 1 & 2 Brown & Sharpe Univ.
Nos. 10 & 11 Brown & Sharpe plain
No. 10 Blanchard rotary surface
No. 75 Heald internal
No. 72 Heald Elec. Indicator auto.
No. 72 A3 Heald Sizematic internal
No. 2 Cincinnati centerless
18" No. 6 Besly opposed disc
16" x 32" Landis crankpin
30" Ingersoll milling cutter grinder

LATHES

12" x 8' & 15" x 6' Sebastian geared head
14" x 6' Mulliner
18" x 6' Reed Prentice
18" x 8' & 24" x 12' Boye & Emmes
8" x 12" Sundstrand stub
No. 3B Foster turret
22" & 26" Libby turret
28" Gisholt turret

MILLERS

No. 2 Cincinnati plain
No. 3 Sundstrand Rigidmil
No. 4-36 Cincinnati Hydromatic
No. 2½ Milwaukee vertical
No. 3 Reed Prentice vertical
8" x 16" Hanson Whitney thread
Type C Hall Planetary thread
No. 4 Lees Bradner thread
42" Ingersoll continuous rotary
48" No. C 66A Newton cont. rotary
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4" Pratt & Whitney spline (duplex)
4" Rice Barton spline (duplex)

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Saginaw, Michigan

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Horizontal
2½", 4" Binsee
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Vertical
66", 120" Niles
42" Bullard, M.D., 54" Colburn M.D., 2 heads

TURRET LATHES

24" Gisholt 6½" hole
Foster Nos. 4, 5, 6, 1B, M.D. Univ.
J. & L. 2¼x24", 3¼x36"
Acme 3¼", M.D.

MDNA MEMBER

GRINDERS

No. 2 Cincinnati Centerless, M.D.
P. & W. 14", B.B. Vert., M.D.
Blanchard 30", M.D.; Modern 12x48", M.D.
Norton Hydraulic 12"x18", M.D.
Heald Nos. 55, 70, 72A Internal, M.D.
Norton 50"x28', M.D.
Gardner 72" disc, M.D.
Landis 6x20", Hydraulic, M.D.
Bryant No. 12, M.D.
Nos. 50, 55, 60 Heald Int. Hydraulic, M.D.
B. & S. Nos. 1, 3, Univ.
B. & S. Nos. 10, 11 S.P.D.
16" Heald Rotary, M.D.
B. & S. No. 2 Surface, M.D.
Norton 10x36" Hydraulic, M.D.
Badger 23" Dbl. Opposed, M.D.

LATHES

P. & W. 1x18, 1¼x18 Automatic Lathes
McCabe 26-42"x14'
24"x12' Boye & Emmes 3 step cone, D.B.G.
20"x14' Rahn-Larmon, raised to 24"
14"x 6' Hendey
9" LeBlond Automatic
36"x30' Putnam, M.D.
36"x20" Putnam, S.C.G., D.C., M.D.
Putnam 42"x16', M.D.
30"x26' L. & S. 12 speed, M.D.
32"x35' Wickes Grd. Hd.

AUTOMATICS

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B. & S. Nos. 2, 6, 6F Hand Screw Machine
Cleveland Model A, ½", ⅝", 1¼", 2"
Cleveland Model B, 1", 2"
⅞" Cone 4 Spindle
P. & J. 6A, M.D.
Five Spindle Davenport Auto., 9/16" cap.
Gridley ⅞", 4 spdl.

GEAR CUTTERS

Nos. 2, 12 Barber-Colman Gear Hobber
B. & S. Nos. 3-26", 4-36"
Gleason 11" Bevel
60" G. & E. Gear Cutter

SHAPERS

10", 20", 26" Stockbridge
15", 24", P. & J.
G. & E. 20", S.P.D.

RADIALS

3', 4', 5', 6', 7', 8' American Triple Purpose
3', 3½', 4', 5' Cincinnati-Bickford
4' Mueller M.D.; 4', 5' Western, S.P.D.

MILLING MACHINES

Cincinnati No. 2 Universal
10" P. & W. Automatic
No. 3S Cincinnati, S.P.D. rapid traverse, M.D.
Nos. 1Y, 0Y, 3, 4, 5, B. & S. Plain and Univ.
B. & S. Nos. 12, 13, 13B
Hall Planetary Model D Thread Miller
Providence Planer Type 32"x8'
Becker Nos. 3, AB, 5, 6 Vert.
Nos. 3, 4 Cincinnati Vert.
P. & W. Nos. 12, 30 Profiler, M.D.
No. 4 B. & S. Universal
K. & T., B. & S. Nos. 2, 3 Dbl. overarm, Timken Bearings
B. & S. Nos. 2, 3 Vert.
Milwaukee No. 2½B Vert.
No. 1 Kempsmith Univ.

MISCELLANEOUS

48" Southwark Gate Shear, ½" cap., 24" gap.
10½"x⅜" Niagara Power Shear, M.D., cap. 18" gap
10' Erie Power Shear, ¼" cap., 15" cap.
Gorton No. 1S Engraving Machine
6 spindle Avey Drill, 15" overhang
Rochester No. 5B Hammer
Feis 6' Throat Punch; Pottstown Tappers
P. & W. 6" Vert. Shaper
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N.B.P. 15" Slotter, M.D.
Thompson-Bibbs Spot Welders 17 KVA
Andersen Tapper; No. 3 Quickwork Rotary Shear
4x4x⅝" Williams & White Angle Bending Roll
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Baker, #2 Keyseater, M.D.
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No. 11 Natco 16 spindle
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No. 24 Foote-Burt, s.p.d., #4 Morse Taper
24" Barnes Camelback
21" Cincinnati-Bickford, single spindle, m.d.
21" Canedy-Otto Single Spindle, m.d.
4' Cincinnati-Bickford Radial, s.p.d.

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No. 75 Fellows High Speed Gear Shaper
No. 715A Fellows High Speed Gear Shaper
No. 5—60" Brown & Sharpe
No. 3—26" Brown & Sharpe
No. 5 Cincinnati
No. 6 Cincinnati
No. 6 Fellows Gear Shaper, m.d.
No. 13 Brown & Sharpe
No. 12 Barber-Colman Hobber
96" Gleason Spur & Bevel Gear Planer
30" Rochester Gear Tooth Rounder

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No. 16 Blanchard Surface
No. 13 Brown & Sharpe Universal
No. 2 Cincinnati Universal
No. 70 Heald Internal
No. 72A3 Heald Gagematic
No. 60 Heald Internal
14"x120" Landis Type C Cylindrical, 4 yrs. old
10"x30" Landis Cylindrical
10"x36" Norton Cylindrical
10"x36" Hill-Clarke Cylindrical
No. 16 Brown & Sharpe Cylindrical
No. 30A Brown & Sharpe Cylindrical
76" Rogers Knife Grinder

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24"x30' Lodge & Shipley, geared hd.
18"x10' American, geared hd.
18"x10' Hendey, geared hd.
18"x 8' American, geared hd.
12"x10' American, c.d.
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14"x 6' LeBlond, c.d.
14"x10' Lodge & Shipley, c.d.
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18"x10' Lodge & Shipley, c.d.
8"x60" Fitchburg Lo-Swing, g.h.

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No. 4L Gisholt, 9¼" Hole in Spindle
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No. 2 Milwaukee Plain, m.d.
No. 1½A Rockford, Plain, c.d.
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No. 2½B Milwaukee Vertical, s.p.d.
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MISCELLANEOUS

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12" Williams Pipe Machine
4" Stevens Vertical Slotter
16" Betts Vertical Slotter
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20" American, c.d.
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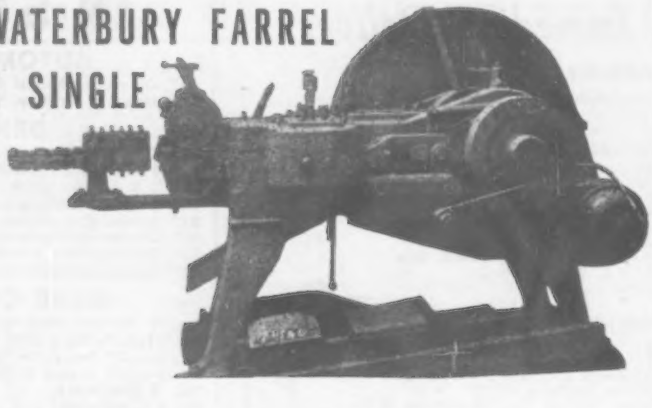

Capacity diameter of wire, ¼"
Cap. maximum length under head 5"
Cap. minimum length under head ⅝"
Blanks per minute for short lengths 150
Blanks per minute for long lengths 100
Size of heading dies, square 1 7/16"
Diameter of punch 1 5/16"
Diameter of feed rolls 8"

Stroke of heading slide 6½"
Diameter of crankpin 5"
Diameter of shaft journals 4½"
Section of frame 4" x 8"
Arranged for motor drive

For cold head and cold forging of small parts made out of wire.

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LODGE & SHIPLEY 30" x 26' Selective Geared Head Lathe
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WARNER & SWASEY 3A Univ. Turret Lathe
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KEARNEY & TRECKER 3B Univ. Miller
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BROWN & SHARPE No. 3 Vert. Miller
WOODWARD & POWELL 60" x 60" x 20' 4 hd. Planer—Rev. M.D.
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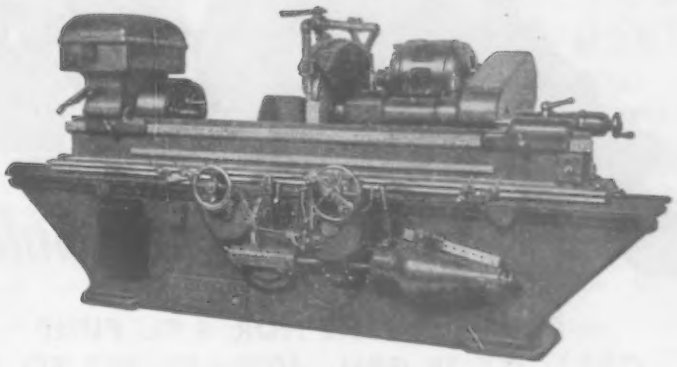

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1— 600	G. E.	MT	550	220
2— 600	G. E.	IM	440/2300	720
1— 450	Whse.	HF	2300	375
1— 400	G. E.	IP	440/2200	600
1— 400	Al. Ch.	ANY	2300	505
1— 400	G. E.	IP	2300	252
1— 350	G. E.	MT-442Y	2300/4000	358
1— 300	G. E.	IM	440	720
1— 300	Whse.	CW	440	585
1— 250	G. E.	MT-424Y	4000	257

Squirrel Cage

1— 300	G. E.	IK-17	440	900
1— 300	Whse.	CS	550	580
1— 200	G. E.	IK	440	900
1— 200	G. E.	IK-17	2200	490
3—175/111	G. E.	IK-16	440	900/720
1— 125	Whse.	CS	220/550	1150

MOTOR GENERATOR SETS
3 phase — 60 cycle

1—1500 KW, G. E., 275 V DC to 2100 HP. 2300/4600 v
1—1000 KW, G. E., 250/275 V DC to 1400 HP. 2300/4150 v
1— 500 KW, G. E., 600 V DC to 700 HP. 6600/13200 v
1— 500 KW, G. E., 275 V DC to 700 HP. 2300 v
1— 400 KW, G. E., 275 V DC to 600 HP. 440/2300 v
1— 200 KW, Whse., 250 V DC to 290 HP. 2200 v

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OVERHEAD ELECTRIC TRAVELING CRANES

	Tons	Make	Span	Current	Remarks
(1)	5	P & H	60'0"	220/3/60	CG. OP.
(1)	8	Toledo	51'6"	230-VDC	CG. OP.
(2)	10	Chesapeake	35'0"	230-VDC	CG. OP.
(1)	10	Whiting	80'0"	440/3/60	CG. OP.
(1)	15	Chesapeake	50'0"	230-VDC	CG. OP.

(1)—7½-ton, 70'0" span Milwaukee, 4-motor double drum Bucket Handling Crane, out door type, 220-V., 3-PH., 60-CY. With this crane we have 150' A-frame out door Steel Runway, 50' high, with 1½-yd. 2-line Blaw Knox clam shell bucket.

(1)—5-ton, 3-motor, P&H out door type crane, 60'0" span, 30'0" lift, cage operated, 440-V., 3-PH., 60-CY., 374' of A-frame out door self supporting steel runway, 30' high. Crane trolley equipped with cable reel. 1½-yd. Hayward Electric Bucket available with this crane.

SPECIAL: (2)—1 ton Shepard Stationary mounted hoists, Form S, 7½ HP. 220/440-V., 3-PH., 60-CY., 88-FPM., 1-part of cable, 32' wrapping cap., Var. speed.

SPECIAL: 3—Shepard, 7½-ton, 2-motor, cage operated. Electric Monorail Hoists, 230-VDC., all parts and motors enclosed, 20-HP., hoist motors, 25/75 FPM., 40' max. lift, 4 parts ⅝" cable, trolley motors, 10-HP., 400-FPM. These hoists designed for high lift, high speed, outdoor service. WE OFFER THESE REBUILT AND GUARANTEED.

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(1)—1500-HP. General Electric 2200/3/60-cy., 293-RPM. with complete control panels, resistance, etc.

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(1)—25-HP. Westghse. Syn. motor or 31.3 KVA Generator, 1800-RPM., 220-V., 3-PH., 60-Cycle with direct connected exciter, complete A.C. & D.C. panel and control.

(1)—100-HP. Westghse. Syn. motor, 1200-RPM., 100% P.F., 2200-V., 3-PH., 60-CY., direct connected exciter, complete A.C. & D.C. panel and control.

230-VDC. CRANE & MILL TYPE MOTORS

	H.P.	Make	Type	R.P.M.
(2)	2	G.E.	C.O.-1803	900
(1)	4	P & H	Size 6x4	850
(1)	4¼	Westghse.	K-2	715
(1)	5	Westghse.	K-3	725
(1)	5	Westghse.	H.K.-2	850
(1)	6	G.E.	C.O.-1805	1150
(1)	7½	G.E.	C.O.-1804	725
(1)	7/9	C.W.	Size A.W.	740/580
(1)	7/10	G.E.	M.D.-102 (Back Axle)	1625/800
(1)	10	P & H	Size 9x5½ (500-volt)	700
(1)	12½	Westghse.	K-4 (115-volt)	800
(10)	14/19	C.W.	Size B.W. (Back Axle)	725/560
(1)	15	Westghse.	H.K.-No. 5	700
(1)	15	G.E.	C.O.-1806	650
(1)	20	G.E.	C.O.-1808	650
(1)	30/42	C.W.	Size D.W.	620/520
(1)	33	Westghse.	K-8	505
(1)	35	G.E.	C.O.-1810	500
(2)	30/37	Westghse.	M.C. No. 50 (C.P.)	550/500
(2)	35/45	G.E.	M.D.-104½ (C.P.)	625/500
(1)	42½	Westghse.	K-8	910
(1)	45	Westghse.	H.K.-No. 9	470
(2)	54/80	C.W.	Size F.W.	575/480

(ALL MOTORS ARE SERIES WOUND EXCEPT WHERE MARKED C.P. COMPOUND WOUND)

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Morgan 10 ton 39'5" span 3 DC motors with motor generator set to give 3 phase 60 cycle 220 volt current if required.
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Bedford 25 ton 43' span 3 AC motors
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Buc-Erie 20B 10 ton electric crane
Byers bearcat crane 6 ton cap.
Browning 25 ton locomotive crane. Std. gauge. Steam
P&H truck crane, 3 ton cap. Boom 50'
Lorain Model 75B 20 ton cap. crane, 50' boom
Vulcan 30 ton saddle tank std. ga. steam
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15 ton Industrial, 40' boom powered by Buda gas engine
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COMPLETE DIESEL POWER PLANT
Rated capacity 390 KW. made up of 3 units with 160 H.P. Chicago Pneu. diesel engines and complete with switchboards and all accessories.

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1, 20 ton Plymouth, std. ga., gasoline
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42" Niles center drive CAR WHEEL LATHE, M.D., complete with 50 H.P. 220 volt D.C. and 3 H.P. 220 V. D.C. motors
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7 cb. ft. and 10 cb. ft. Possibly Gasoline Motor driven. Must be in perfect working condition.
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URGENTLY NEEDED
1500 Ton Coining Press.
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one with 30" width and 5" diameter arbor, for slitting sheets from 16 to 18 gauge, and
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16 gauge x 12 feet
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ENGINEERS and DESIGNERS with mechanical training and experience in development and construction of light and medium weight machinery, can find unparalleled opportunities to apply training, ingenuity and initiative in adapting recent laboratory developments to the production lines of a manufacturer in Upper New York State. Salaries are open and subject to adjustment for outstanding accomplishments. Statement of availability required. Address Box Z-584, care *The Iron Age*, 100 E. 42nd St., New York 17.

CHIEF MAINTENANCE MAN. Must be familiar with maintenance of all types of forging equipment. Position with large midwest concern. Write giving full particulars about yourself as to age, experience, etc. Statement of availability required. Address Box Z-610, care *The Iron Age*, 100 E. 42nd St., New York 17.

STRUCTURAL STEEL DETAILER, ENGINEER, ESTIMATOR, BY OLD ESTABLISHED STEEL FABRICATOR. THESE POSITIONS ARE PERMANENT. IDEAL WORKING AND LIVING CONDITIONS. STATE AGE, EDUCATION, EXPERIENCE, SALARY DESIRED, ETC. STATEMENT OF AVAILABILITY REQUIRED. ADDRESS BOX Z-608, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17.

METALLURGIST FOR ALLOY STEEL FOUNDRY with experience on heading and gating, and mold washes. State experience and minimum salary. Statement of availability required. Address Box Z-598, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

WANTED
Production Research Metallurgist

to work with aluminum and magnesium alloys, by large plant with essential classification in middle western city; college graduate with minimum of 5 years' experience in smelting or foundry work. Long established company with good postwar outlook.

Statement of availability required.

Address replies to Box Z-581
Care *The Iron Age*, 100 E. 42nd St., New York 17

COMMUNICATION EQUIPMENT

Technical and Production Engineers Required by Midwest Manufacturer. Essential War and Peace Product. Statement of availability required.

ADDRESS BOX Z-544
Care *The Iron Age*, 100 E. 42nd St., New York 17

— WANTED —
TUBE MILL SUPERINTENDENT

A comparatively young man capable of being superintendent of a cold drawn seamless steel tube mill. Submit detailed information regarding education, qualifications and past experience. Statement of availability required.

ADDRESS BOX Z-588
Care *The Iron Age*, 100 E. 42nd St., New York 17

WANTED — DESIGN ENGINEER. Established Southern manufacturer needs graduate engineer experienced in design of tools and dies for small mechanical parts. Plastic mold design experience desired but not essential. This is postwar opportunity with company whose products have international distribution. State experience, education, age, salary expected, etc. Statement of availability required. Address Box Z-603, care *The Iron Age*, 100 East 42nd St., New York 17.

PLATER EXPERIENCED FOR CIVILIAN post war production, on small metal novelties. Must have knowledge of gold, silver, nickel, brass, cadmium, chrome, and zinc plating. Excellent opportunity. Complete charge of department. Statement of availability required. ADDRESS BOX Z-625, care *The Iron Age*, 100 E. 42nd St., New York 17.

ASSISTANT FOUNDRY SUPERINTENDENT. Young man wanted for long established New England Foundry making small and medium machinery castings. Should have engineering degree or other technical training and knowledge of costs, time study and advanced foundry methods. Submit complete details and salary expected. Address Box Z-601, care *The Iron Age*, 100 E. 42nd St., New York 17.

WAREHOUSE MANAGER. Must be capable of complete management of steel warehouse located in South. Salary and percentage of profits to man capable of doing a real job. Send full details and referenees. Statement of availability required. Address Box Z-612, care *The Iron Age*, 100 E. 42nd St., New York 17.

DRAFTSMEN AND ENGINEERS. Experienced in the electric railway and steam railroad car building business. State age, education, past experience and salary expected. Statement of availability required. Address Box Z-556, care *The Iron Age*, 100 E. 42nd St., New York 17.

EMPLOYMENT EXCHANGE

HELP WANTED

MECHANICAL ENGINEERS
ELECTRICAL ENGINEERS

Engineers experienced in Machine Design and Sheet Metal Products or Household Appliances.

Must have successful pre-war background. Permanent position with large, progressive organization. In replying give full particulars, places worked, projects, etc.

Statement of availability required.

Institute of Product Research
Dept. LAH—448 S. Hill Street
Los Angeles 13, California

Tool Room Supt.

Newark

To supervise large tool room. Mechanical engineering background and a minimum of 10 yrs. diversified practical experience in the manufacture of small precision dies and tools essential. Work will include planning and Personnel administration.

Prefer applicant 40 to 50 yrs. who is thoroughly familiar with various phases of mass production manufacture of metal articles.

We are a long established company located nearby New York City and have no reconversion problems. Statement of availability required.

Box 475, Realservice
110 West 34th St., N.Y.C.

WANTED

Tool and Methods Engineer

capable of taking charge of tool design, methods, process planning, and standards. Prefer a man with experience in hot upsetting, threading, machining and finishing of a wide variety of precision upset bolts and forgings, drop forgings, automatic and turret lathe parts. Please give complete data of background, age, and salary requirements. Small, progressive, growing, Eastern manufacturer.

Statement of availability required

ADDRESS BOX Z-616
Care *The Iron Age*, 100 E. 42nd St., New York 17

ELECTRICAL ENGINEER. A Western New York manufacturer of heavy machine tools desires the services of an electrical engineer or experienced draftsman willing to break in on electrical designing. The work will consist of designing control panels, switchboards and electrical systems of large machine tools. This opening is permanent to the right man and offers excellent post-war prospects with well established, nationally recognized machine tool manufacturer. Apply by letter, stating age, experience, education and other pertinent data. W.M.C. rules apply. Address Box Z-516, care *The Iron Age*, 100 E. 42nd St., New York 17.

SUPERINTENDENT—Well established heavy industry making equipment for cutting and forming sheet metal has opening. Give details of education, personal qualifications and work history in letter of application which will be held in confidence. Employment in accordance with existing W.M.C. regulations. Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y.

HELP WANTED

TOOLROOM FOREMAN

New York environment. Located in North Bergen, New Jersey. 20 minutes from Times Square, New York. Toolroom with about twenty die makers. We have excellent equipment. Applicant must have at least ten years of diversified, practical experience in the building of small progressive and precision dies. Should be thoroughly familiar with mass production of small ornamental metal articles. Age preferably 35 to 50 years. Permanent job, liberal pay with future and substantial annual bonus. References required.

Statement of availability required.

ADDRESS BOX Z-617
Care *The Iron Age*, 100 E. 42nd St., New York 17

WANTED: ASSISTANT TO CHIEF INSPECTOR FOR ONE OF THE COUNTRY'S LEADING MANUFACTURERS OF ELECTRIC RESISTANCE WELDED TUBING. MUST HAVE THOROUGH KNOWLEDGE OF MANUFACTURING PRACTICE IN WELDED MECHANICAL AND PRESSURE TUBING. EXPERIENCE IN FORGINGS AND TUBE FABRICATION HELPFUL BUT NOT ESSENTIAL. GOOD POST-WAR POSSIBILITIES. STATE PAST FIVE YEARS' EXPERIENCE IN FIRST LETTER. STATEMENT OF AVAILABILITY REQUIRED. ADDRESS BOX Z-505, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17.

WANTED — Carbide Technician. Well-known eastern company with established sales outlet has excellent opportunity for Chief Technician to develop carbide line, especially for wear resistant applications. Fundamental processing equipment installed. Company also interested in cast tool developments, precision and centrifugal castings, with particular reference to special heat resisting applications, such as gas turbines. State age, education, experience, salary desired and draft status. Statement of availability required. Address Box Z-479, care *The Iron Age* 100 E. 42nd St., New York 17.

OHIO MANUFACTURER WITH MALLEABLE and brass foundries and fine postwar prospects desires young metallurgist. Give complete record of education and experience, and salary expected. Statement of availability required. Address Box Z-412, care *The Iron Age*, 100 E. 42nd St., New York 17.

WANTED—Designer, Draftsman & Estimator. Must have full knowledge of A.S.M.E. construction on all types of pressure vessels and other complicated steel plate construction of refining equipment, etc. Plant located in Texas. Statement of availability required. Address Box Z-339, care *The Iron Age*, 100 E. 42nd St., New York 17.

WANTED: FOUNDRY FOREMAN, malleable iron foundry in middle west. Give full particulars regarding age and qualifications. Statement of availability required. Address Box Z-624, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

Factory Supt.

Executive qualified to take charge of large production unit with nationally known plant located nearby New York City. Firm manufactures small metal articles to close tolerances.

Applicant must be thoroughly familiar with all phases of modern production methods. Prefer a man 40 to 50 years with M.E. or equivalent. Statement of availability required. Write fully.

Box 424, Realservice
110 West 34th St., N.Y.C.

POSITION OPEN ASSISTANT MANAGER —STEEL DEPARTMENT OF WELL ESTABLISHED METAL & ORE IMPORT AND EXPORT FIRM. MUST BE WELL CONNECTED YITH INDUSTRY AND EXPERIENCED IN EXPORT BUSINESS. STATE AGE, PREVIOUS EXPERIENCE, SALARY, ETC. APPLICATIONS WHICH WILL BE TREATED IN STRICT CONFIDENCE SHOULD BE ADDRESSED TO BOX Z-615, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17. STATEMENT OF AVAILABILITY REQUIRED.

PRODUCT ENGINEER: Cleveland manufacturer with high production machining and stamping facilities needs young graduate engineer experienced in product design to make product analysis and handle development of new mechanical products for post-war. Attractive salary in line with accomplishments. Reply giving qualifications. Address Box Z-537, care *The Iron Age*, 100 East 42nd St., New York 17.

WANTED FIRST CLASS STRUCTURAL steel estimator and detailer, familiar with shop costs. Plant located in pleasant midwestern city offering many advantages. This is a permanent job for the right man. All details, age, education, experience, and salary expected in first letter. Statement of availability required. Address Box Z-586, care *The Iron Age*, 100 E. 42nd St., New York 17.

DRAFTSMEN WANTED. Experience in heavy machine tool work desirable, aircraft experience acceptable. Outstanding post-war picture for right men. Location—upstate New York. W.M.C. rules observed. Give full particulars in letter addressed to Box Z-504, care *The Iron Age*, 100 E. 42nd St., New York 17.

WORKS MANAGER—Well established heavy industry making equipment for cutting and forming sheet metal has opening. Give details of education, personal qualifications and work history in letter of application which will be held in confidence. Employment in accordance with existing W.M.C. regulations. Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y.

WANTED—ELECTRIC FURNACE OPERATORS in Los Angeles steel foundry. Good opportunity for dependable man. Post war work assured. Write giving full details including when available. Statement of availability required. Address Box Z-381, care *The Iron Age*, 100 E. 42nd St., New York 17.

WANTED—EXPERIENCED MAN to take charge of brazing department, involving induction and electric furnaces and torches. Should have some engineering ability. Certificate of availability required. State fully all experience and last earnings. Address Box Z-605, care *The Iron Age*, 100 E. 42nd St., New York 17.

EMPLOYMENT EXCHANGE

REPRESENTATIVES WANTED

WANTED
AMBITIOUS REPRESENTATIVES

Exceptional opportunity to sell nationally advertised AAA products approved and used by Government Agencies and large and small manufacturers for fabrication of metals, salvage, and reclamation. Good territories still open. Immediate commission earnings from $150.00 to $400.00 and up weekly. Qualifications: Technical or welding background indispensable. Essential position. If you are a hard worker and have ability, our Regional Manager will show you fine results of other representatives. Send outline of past technical and sales activities.

Write to
BENT LAUNE, *Regional Manager*
Room 1113
40 Worth St., New York 13, New York

SALES REPRESENTATIVE WANTED—RESPONSIBLE INDIVIDUAL OR ORGANIZATION NOW CONTACTING MANUFACTURERS WHO WORK IN METAL. EXCEPTIONAL OPPORTUNITY WITH LONG ESTABLISHED ILLINOIS CONCERN, FABRICATORS OF ROLLED MOULDINGS IN ALL METALS. REPLY FULLY IN CONFIDENCE, STATING EXPERIENCE, LINES REPRESENTED AND TERRITORY COVERED. ADDRESS BOX 7816-A, CARE *THE IRON AGE*, 1134 OTIS BLDG., CHICAGO, ILLINOIS.

REPRESENTATIVE WANTED—A new but proven manufacturer of bolts, nuts, screws and special headed and threaded parts, located in the Chicago area, invites inquiries from manufacturers' agents located in the following areas: Cleveland, Pittsburgh, Buffalo, and Rochester.

They should have contacts with large users and should be selling production items. Give some details in first letter. Address Box D-252, care *The Iron Age*, 1134 Otis Bldg., Chicago 3, Ill.

MANUFACTURER OF FOUNDRY CORE OILS and allied Foundry Products has opening for additional salesmen in the states of Michigan and Western New York. Excellent opportunity for progressive man with a knowledge of the Foundry Industry. Give complete details of previous experience, age, etc. All replies held in strict confidence. Address Box Z-573, care *The Iron Age*, 100 E. 42nd St., New York 17.

ACCOUNTS WANTED

Manufacturer's Representative

Cleveland, covering Ohio desires added line on exclusive basis. Only first rate Company considered. Representative extremely well known. Flat die forgings, castings, die castings, etc., considered. Downtown office.

ADDRESS BOX Z-607
Care *The Iron Age*, 100 E. 42nd St., New York 17

FOUNDRY SALES REPRESENTATIVE CHICAGO AREA—OFFICE ESTABLISHED OVER 10 YEARS. SPECIALIZING SALE OF FREE MACHINING LIGHT GRAY IRON CASTINGS. COMMISSION BASIS. PREFER FOUNDRY OVERNIGHT TRUCKING DISTANCE CHICAGO. OPPORTUNITY FOR RELIABLE FOUNDRY TO DEVELOP PERMANENT CUSTOMERS AMONG CHICAGO'S LEADING MANUFACTURERS. ADDRESS BOX Z-589, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17.

CASTING SALES REPRESENTATIVE—Have successfully operated own New York City Sales office over twenty years; exclusively castings. Need gray iron foundry that can make some reasonably prompt deliveries soon and large deliveries post war. Side floor and bench work available. Machining and finishing if desired. Commission basis. Address Box Z-592, care *The Iron Age*, 100 E. 42nd St., New York 17.

ACCOUNTS WANTED

Representative widely acquainted in the industrial field of New York, New Jersey, New England, Delaware, Maryland, Pennsylvania, and other states, invites expression of interest from Manufacturers of Fabricated Stainless, Alloy Steel and Carbon Steel Process equipment and accessories for the Chemical, Petroleum, Plastics, Food-Products, Pulp and Paper, and Steel Heat-Treating Industries who desire experienced and intelligent representation in the Eastern States by one who has been Manager of sales of such equipment for the past twenty years.

ADDRESS BOX Z-600
Care *The Iron Age*, 100 E. 42nd St., New York 17

EXPORT

We are exclusive representatives of American manufacturers for all parts of the World and have our agencies established. We are interested in adding a few more lines. We attend to all shipping formalities and pay cash here. Correspondence solicited. *References Irving Trust Co., Dun's.*

TERMINAL EXPORT CO., INC.
420 Lexington Ave. (Graybar Bldg.), N. Y. 17, N. Y.

SALES ENGINEER FOR HOUSTON, TEXAS. I would like to represent manufacturers of mechanical equipment or items suited for this area. References and background given on request. Address Box Z-614, care *The Iron Age*, 100 E. 42nd St., New York 17.

SITUATIONS WANTED

YOUNG MATURE VETERAN. 4 years direct sales, 1 year supervision. Traveled Europe, South America. Knowledge aircraft, automotives, machinery. Desires responsible position with future. Location Open. Address Box Z-611, care *The Iron Age*, 100 E. 42nd St., New York 17.

SPECIFICATIONS - STANDARDS ENGINEER (Mechanical), with over 10 years' experience on diversified products and materials, seeking position with a future. Address Box Z621, care *The Iron Age*, 100 E. 42nd St., New York 17.

SALES EXECUTIVE, capable engineer, sales man, organizer, manager. 12 years as machine tool salesman and dealer, can get results. Address Box Z-490, care *The Iron Age*, 100 E. 42nd St., New York 17.

EMPLOYMENT SERVICE RATES
HELP WANTED RATES
REPRESENTATIVE WANTED RATES
ACCOUNTS WANTED RATES

Set solid, 50 words or less $5.00
Each additional word 10c

All capitals, 50 words or less $6.50
Each additional word 13c

All capitals, leaded 50 words or less $7.50
Each additional word 15c

SITUATION WANTED RATES

Payable In Advance

Set solid, 25 words or less $1.00
Each additional word 4c

All capitals, 25 words or less $1.75
Each additional word 7c

All capitals, leaded, 25 words or less $2.50
Each additional word 10c

Count Seven Words for Keyed Address

DISPLAY RATES ON REQUEST

Do not send cash through the mail. Use money order or check. Do not send original letters of recommendation in reply to advertisements—Copies will serve the purpose. Replies forwarded without charge.

SITUATIONS WANTED

METALLURGIST: B.S. DEGREE. Four years general experience includes supervision of heat treating, corrosion control of chemical processes, selection and recommendation of materials, analysis of material failures and welding problems, and some research. Interested in responsible position with progressive firm. Will travel or leave the States. If you want a conscientious young man with a good personality Address Box Z-623, care *The Iron Age*, 100 E. 42nd St., New York 17.

LAZY, YOUNG METALLURGIST OF 10 years unforgetable struggle with the rearranging of metallic molecules would consider an affiliation as Sales Engineer, trouble shooter, or Metallurgist with any prominent manufacturer who would promise not to take the joy out of life, not demand over 44 hrs. of work per week, and would tolerate an overhead of $7,200 per annum. Address Box Z-619, care *The Iron Age*, 100 E. 42nd St., New York 17.

WORKS MANAGER—Graduate Engineer with 12 years' shop and organization experience on metal fabrication and machining operations. Experience covers—Engineering design and development, Metallurgy, Production Engineering and Planning Control, Welding Engineering—(all phases), Industrial Engineering, Plant Engineering, Purchasing, Factory Cost Control, Training, and Personnel Supervision. Address Box Z-597, care *The Iron Age*, 100 E. 42nd St., New York 17.

METALLURGICAL ENGINEER. Ph. D. Over twenty-five years' diversified technical and sales experience. Thorough knowledge alloy, carbon, and stainless steels, metallography, application, heat treatment, etc. Laboratory design and organization. Desires connection as Chief Metallurgist or Director Research and Development with post-war future. Eastern location. Available. Address Box Z-583, care *The Iron Age*, 100 E. 42nd St., New York 17.

MECHANICAL EXECUTIVE, with 25 years' experience, available for early engagement. Successfully filled responsible positions with well known manufacturing concerns. Experience covers organizing, planning, processing, designing and supervising to lower manufacturing costs. Proven organizing and executive ability. Well versed in modern methods and equipment. Address Box Z-567, care *The Iron Age*, 100 E. 42nd St., New York 17.

METALLURGICAL ENGINEER B. S. MET. ENG. experienced in production control, research and development work with most commercial grades of carbon and alloy steels and aluminum alloys. Desires position of responsibility as Metallurgist or Sales Engineer with a prominent Manufacturer preferably located in the East. Address Box Z-620, care *The Iron Age*, 100 E. 42nd St., New York 17.

MECHANICAL ENGINEER, with broad experience in the design, application and standardization of bolts, nuts, screws, rivets and other similar mass produced parts, seeking position where application of this experience would be useful. Address Box Z-622, care *The Iron Age*, 100 E. 42nd St., New York 17.

PLANT MANAGER: experienced metal specialties, machine tools, farm tools, precision parts. College in administration, engineering accounting. Calibre for responsibility, capacity to deliver results. An alive and successful proposition. Under 50. American. Address Box D-254, care *The Iron Age*, 1134 Otis Bldg., Chicago 3.

FACTORY MANAGER OR SUPERINTENDENT. Capable man desires contact reliable manufacturer for permanent position. Thoroughly experienced in all phases of production management. Fully capable to direct manufacturing plant and produce results. Address Box Z-579, care *The Iron Age*, 100 E. 42nd St., New York 17.

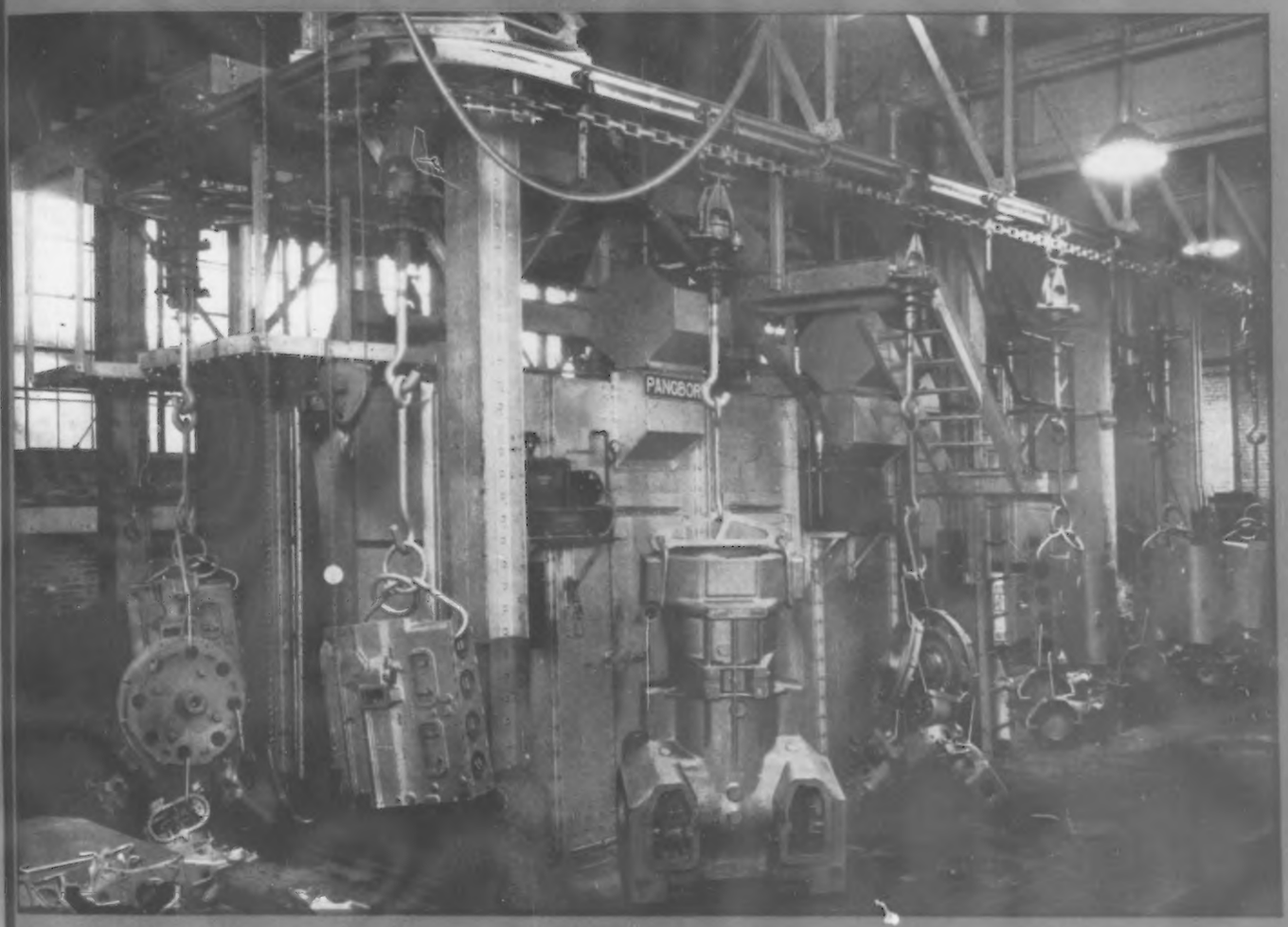
PRODUCTION MANAGER OR ASSISTANT—Mechanical Engineer, 14 years' experience production and material control, medium and heavy industry. Interested in a connection with a future. Address Box Z-590, care *The Iron Age*, 100 E. 42nd St., New York 17.

ADVERTISERS IN THIS ISSUE

CLASSIFIED SECTION

WPB SAYS
"METAL PARTS ARE CRITICAL ESSENTIAL PRODUCTS"

O WHAT? *when all plants are handicapped by the severe LABOR SHORTAGE*



IF it's impossible to get sufficient help to produce your orders, consider this:

Pangborn equipment, handling work by the conveyor hook method, will increase the tonnage per man in your cleaning room operations several hundred percent.

Photograph reproduced is a typical ROTOBLAST* installation in Mid-West customer's plant. Castings shown weigh from 75 pounds to 1200 pounds each. The work cleaned with this installation averages *35,000 pounds per hour.*

Simplicity of operation is shown by these three steps:

1. **Hang castings on conveyor hooks**
2. **Castings travel through ROTOBLAST Cabinet**
3. **Thoroughly cleaned castings delivered to chippers and grinders in continuous flow at pre-determined speed.**

If you have a labor shortage problem—big or little—"Come to Pangborn!"

**Trade-mark of Pangborn Corporation*

RLD'S LARGEST MANUFACTURER OF BLAST CLEANING AND DUST CONTROL EQUIPMENT

PANGBORN

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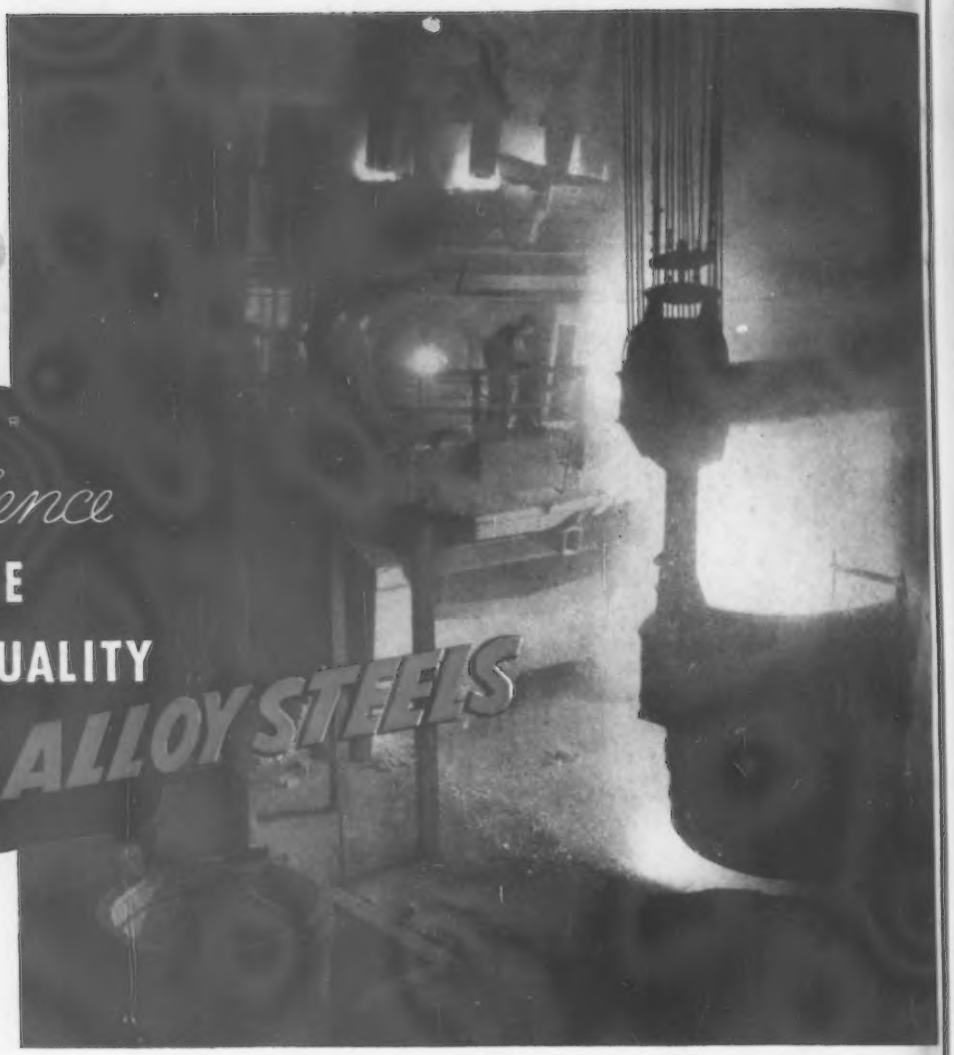

Art and Science CREATE THE UNEXCELLED QUALITY OF TIMKEN ALLOY STEELS

It takes about 11 hours between the time the giant electric or open hearth furnaces are charged until they are tapped, releasing molten . . . white hot Timken Alloy Steel to give strength and quality to the tools of war and victory.

Before and during those hours laboratories and melt shop hum with activity. Scrap is analyzed. Alloys are checked. Good bottoms are maintained by fettling after each heat. Furnaces are skillfully charged to assure exact, uniform melting. Temperatures are carefully controlled. Frequent samples are taken from the furnace. Some are tested immediately in the carbometer, others are whisked to the laboratory for chemical and spectographic analysis. Results, flashed back via telautograph to the melter, are used to determine the alloy additions necessary to maintain the high standard of accuracy set for the chemical composition, grain size, hardenability, physical and mechanical properties of Timken Alloy Steels.

Those precise control measures are your assurance that products made of these fine steels will function satisfactorily . . . even in the most difficult service. If you wish, a member of our technical organization will help you select the Timken Alloy Steel that will most economically meet your needs. Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

Timken Alloy Steels are made in open hearth and electric furnace grades. Regular alloy and stainless steels are available in billets, bar stock and seamless tubes.

TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

ALLOY STEELS